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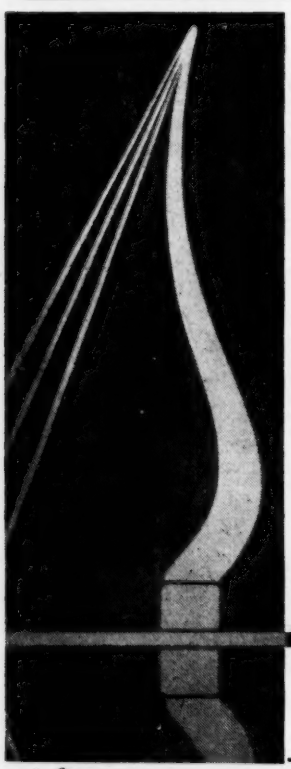

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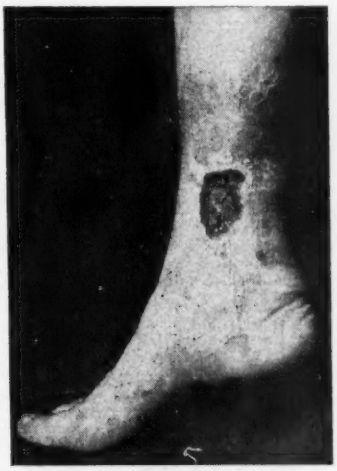

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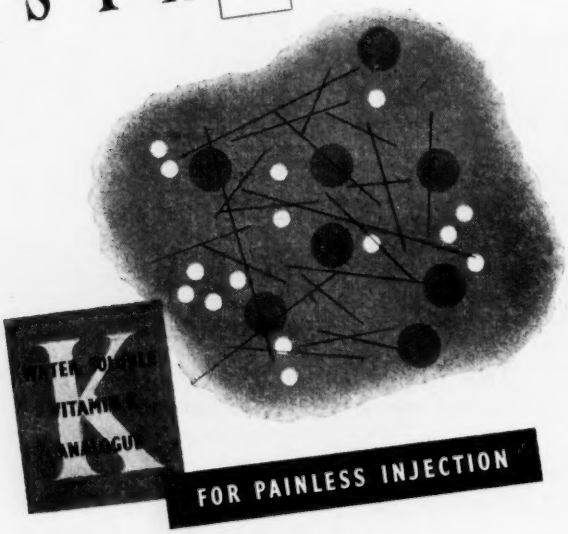
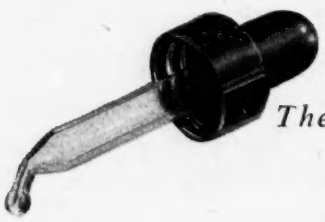


Maintenance of the blood prothrombin level, which is the physiological function of vitamin K, is a significant factor in a variety of haemorrhagic conditions such as neonatal haemorrhage, obstructive jaundice, menorrhagia, metrorrhagia, etc. In such conditions 'Synkavit' can be of greater assistance than the natural vitamin. It is water-soluble and can therefore be given by mouth without additional bile salts; it can also be given parenterally by subcutaneous, intramuscular or intravenous injection.

Tablets of 10 mg. Ampoules of 10 mg.

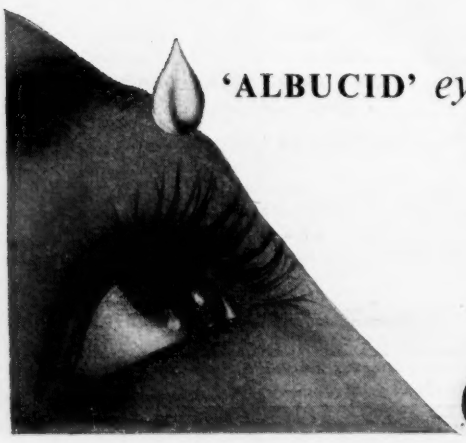
ROCHE PRODUCTS LIMITED · WELWYN GARDEN CITY · HERTS

'ALBUCID'



The First name in Ocular Therapeutics

Active against a very wide range of organisms causing ocular infections, 'Albucid' Eye Preparations are known and trusted wherever eye injuries and infections are treated.



'ALBUCID' *eye preparations are available as follows:*

EYE DROPS

Sulphacetamide Sodium B.P. 10%, 20% or 30% in sterile solution, packed with pipette in sealed bottles.
Bottles of 14 c.c. (½ fl. oz.)

EYE OINTMENT

Sulphacetamide Sodium B.P. 2½%, 6% or 10%.

Tubes of 4 Gm. (60 grain) and 25 Gm.

Descriptive literature and samples available on request.

British Schering Limited

229-231, *Kensington High Street, London, W.8.*
telephone: WEStern 8111

SB.1/52

'ERYTHIN'

Brand

TABLETS

RATIONAL SYMPTOMATIC TREATMENT OF

ANGINA PECTORIS and CARDIOSPASM

Prepared with a chocolate basis, each tablet contains Liq. Glyceryl. Trinit. B.P.C. ½ min., Erythrityl. Tetranit. Dil. B.P.C. ¼ gr., Phenobarbiton. B.P. ¼ gr. The rapid action of Glyceryl Trinitrate is supported by the more prolonged effect of Erythrityl Tetranitrate, with Phenobarbitone as a sedative.

In bottles of 25, 100, and 500 tablets

Samples and literature are available on request

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Manufacturing Chemists

35-43, CHARLOTTE ROAD, LONDON, E.C.2
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Advertised and Introduced ONLY to the Medical Profession

Antiseptic, Sedative, Broncho-pulmonary Medication

PULMO-BAILLY

GUAIACOL : CODEINE : PHOSPHORIC ACID

in Glycerine and Sugar aqueous vehicle.

Approximate percentages: Guaiacol 1.5; Codeine, 0.14; Phosphoric Acid, 50% H_3PO_4 3.00

FACILITATES EXPECTORATION: RELIEVES BRONCHIAL CONGESTION
CHECKS EXCESSIVE COUGHING: STIMULATES RESPIRATION
PROMOTES RESTORATION OF PHYSICAL HEALTH

INDICATED ESPECIALLY IN BRONCHITIS, BRONCHIECTASIS, INFLUENZA, PLEURISY, PNEUMONIA

POSOLOGY
One teaspoonful in water, two to four times daily.

PACKINGS
Standard pack: Bottle of 90 c.c.
Dispensing packs: 16 and 80 fluid ounces.

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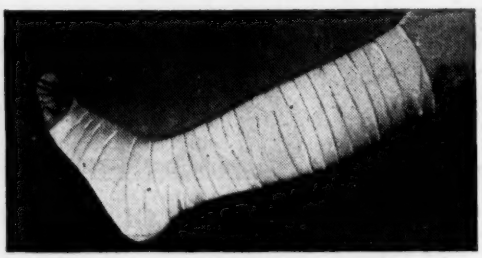
MOUNT PLEASANT, ALPERTON, WEMBLEY, MIDDLESEX

VARICOSE ULCER of 27 YEARS DURATION HEALED IN 5 MONTHS

The area of this ulcer on a 72-year-old woman was 56 sq. cms.

TREATMENT : Elastoplast applied as follows: no dressing to ulcer. Stirrup from head of fibula along lateral side of leg, under sole and up medial aspect of leg to level of tibial tubercle. Long strip from tibial tubercle along anterior surface to base of toes. Elastoplast applied as continuous circular turns from base of toes to tibial tubercle enclosing heel, each turn overlapping the preceding one by ⅝ of its width. Two bandages were required and were applied as tightly as possible by hand. Patient instructed to perform normal household duties.

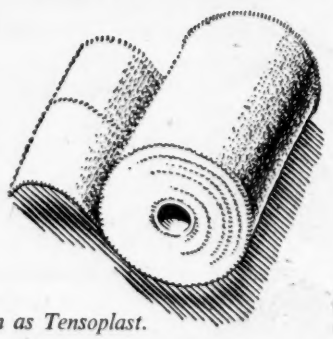
The ulcer was re-dressed at fortnightly intervals, its area steadily reducing until it disappeared after twenty-two weeks.



Elastoplast TRADE MARK *elastic · adhesive* BANDAGES

Elastoplast Elastic Adhesive Bandages *are widely used not only in this country but throughout the world, because they have been found to give the precise degree of compression and grip required for successful treatment of varicose conditions. Elastoplast is an approved dressing for all chronic conditions of the leg. It is also invaluable as a post-operative dressing, as a strapping for compression and support and for many purposes when a comfortable, occlusive dressing or elastic support is required. Full information from the Medical Division, T. J. Smith & Nephew Ltd., Hull.*

Elastoplast elastic adhesive bandages are available in widths of 2″, 2½″, 3″, 4″ x 5 yards minimum stretched length.

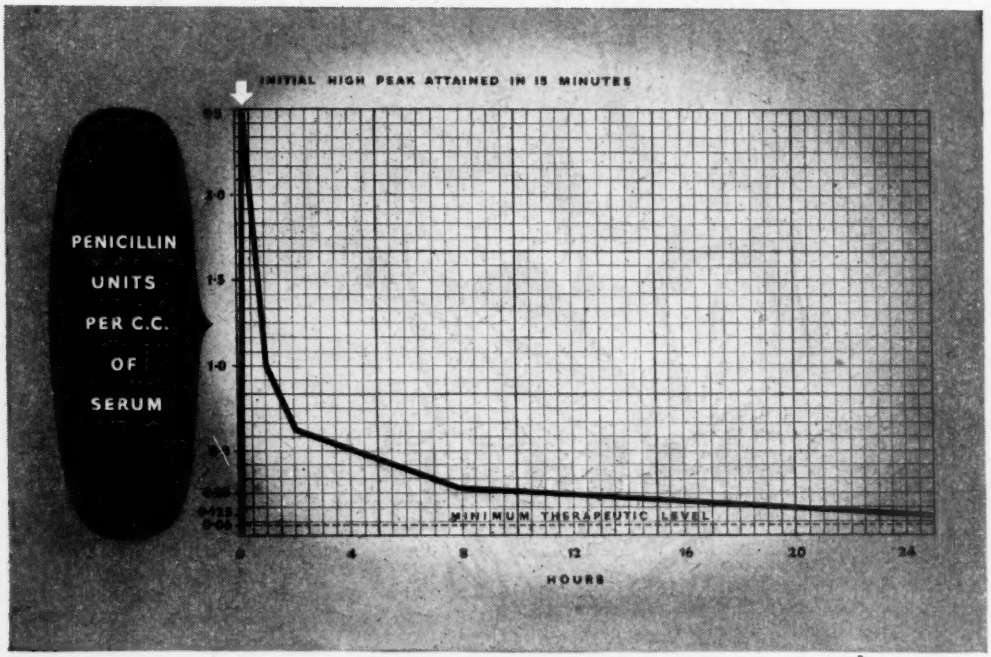


Outside the British Commonwealth, Elastoplast is known as Tensoplast.

'AVLOPROCIL' N.A.

FOR AQUEOUS INJECTION

A new formulation of 'Avloprocil' with a dual effect



'AVLOPROCIL' N.A. is a fortified procaine preparation which contains, when sterile water is added, 300,000 units crystalline penicillin G (procaine salt) and 100,000 units buffered crystalline penicillin G (sodium salt) in each c.c. The aqueous suspension is readily prepared and is easy to administer.

NOTEWORTHY FEATURES

A single injection of 'Avloprocil' N.A. provides:—

★ *A high initial penicillin blood concentration during the first three hours.*

★ *An adequate therapeutic blood level which is maintained for at least 24 hours.*

'Avloprocil' N.A. ensures a quick response wherever penicillin therapy is indicated.

Issued in single-dose vials containing a total of 0.4 mega units of penicillin as:—
300,000 *units crystalline penicillin (procaine salt)*
100,000 *units crystalline penicillin (sodium salt)*

IMPERIAL CHEMICAL (PHARMACEUTICALS) LIMITED
A subsidiary company of Imperial Chemical Industries Ltd. WILMSLOW, MANCHESTER

Ph.26

IT DEPENDS WHAT YOU MEAN BY 'TONIC'

SOME SAY that strychnine is the only true tonic. Others use the word tonic more widely, to include all those drugs and combinations of drugs which improve the well-being of the patient during convalescence and at other times when vitality and resistance are low.

'Epitone' is a well balanced tonic preparation which presents ferrous iron in an active form together with the more important factors of the Vitamin B complex, with strychnine and caffeine.

'EPITONE' TONIC & RESTORATIVE

IN BOTTLES OF 8 OR 16 FL. OZ.

Literature, samples & further information from the Medical Department
BOOTS PURE DRUG COMPANY LIMITED NOTTINGHAM ENGLAND

Boots

S.123

THROMBIN (MAW) in Surgery

ITS USES AND TECHNIQUE

The characteristic property of THROMBIN *is that when mixed with plasma it produces a true physiological clot. This reaction can take place within a few seconds, needs no other substances, and works well in citrated plasma —whether fresh or reconstituted. As such,* THROMBIN *has an increasingly large part to play in surgery.*

SKIN GRAFTING & PLASTIC SURGERY

Rapid Adhesion. THROMBIN combines with plasma to form a 'physiological glue', which allows a graft to be fixed securely into position. Young and Favata used this technique: the graft was wetted with THROMBIN and the bed of the wound with plasma; the two surfaces were then placed together. It was found that a few minutes later the graft was so firmly adherent that it wrinkled and flattened when the underlying muscles moved—and that no splints, sutures or retentive dressings were necessary.

This technique can be successfully used under the stress of an emergency, when special skin-grafting skill is not always available.

Quicker Vascularisation. THROMBIN has been found to accelerate vascularisation in skin grafting — thus giving better results in the survival of the grafts. This seems due to the fact that the fibrin threads act as 'scaffolding' for the growth of the capillaries.

HAEMOSTASIS

THROMBIN will often control the oozing type of hæmorrhage. The surface should first be swabbed clean of blood, then syringed with a solution of concentrated THROMBIN.

The use of absorbable hæmostatic dressings (such as fibrin foam, gelatin foam and alginates) allows THROMBIN to be applied by soaking the dressing in a solution of the enzyme. These dressings, though hæmostatic on their own, are more efficient when used with THROMBIN; and — since effective hæmostasis depends on speed — this is now the common practice.

THE FILLING OF "DEAD SPACES"

THROMBIN has been successfully used in the filling of 'dead spaces', for it has been found that physiological clots rapidly become organised tissue. The space is filled with plasma in which penicillin is dissolved, and then clotted with a few drops of THROMBIN solution. This technique has been used in tonsillectomy and mastoidectomy, and there are many more surgical conditions which have similar requirements.

NOTE: *Thromboplastin—whether applied or produced from the patient's own tissues — is ineffective in the presence of citrated plasma.*

MORE FACTS ABOUT THROMBIN

STABILITY:— THROMBIN keeps indefinitely in the dry state —and therefore may be kept in stock against an emergency. In solution it is less stable and should be used on the day of preparation.

STERILITY:— THROMBIN is sterilised by filtration, and needs no resterilisation.

ADSORPTION:— THROMBIN is easily adsorbed by solids and therefore must not be applied by using a brush or cotton wool swabs. It should be sprayed or dropped on to the surface where it is wanted.

APPLICATION:— THROMBIN is supplied in a dry ampoule, together with an ampoule of diluent. Solution is very rapid and the liquid is immediately available.

QUANTITY:— THROMBIN solution generally reacts with several times its own volume of plasma, so that normally there is an excess of fibrin. No exact measurement is possible or necessary, since proportions vary with the nature of the operation and the technique of the surgeon.

We shall be glad to supply any further information. Inquiries about the use or application of THROMBIN *should be addressed to: The Medical Research Department, S. Maw Son & Sons Ltd., Barnet, Herts. Phone: Barnet 5555*

IMPORTANT
PRICE REDUCTION

The Distillers Company (Biochemicals) Ltd., Speke, Liverpool, 19, on behalf of its distributors: Allen & Hanburys Ltd., The British Drug Houses Ltd., Burroughs Wellcome & Co., Evans Medical Supplies Ltd., Imperial Chemical (Pharmaceuticals) Ltd., and Pharmaceutical Specialities (May & Baker) Ltd., announces the following reduced retail prices from April 28th:

Crystalline Penicillin G, Sodium Salt and Potassium Salt (buffered)

	Single vial	Box of 5 vials
* 0·1 mega unit	1s. 1½d.	5s. 7½d.
0·2 mega unit	1s. 4½d.	6s. 10½d.
0·5 mega unit	2s. 6d.	12s. 6d.
1·0 mega unit	4s. 1½d.	20s. 7½d.
		Single container
5·0 mega units		18s. 0d.
10·0 mega units		34s. 3d.

* Potassium salt (buffered) not available in this size vial.

'Distaquaine' G (brand)

	Single vial	Box of 5 vials
0·3 mega unit	1s. 10½d.	9s. 4½d.
0·9 mega unit	4s. 7½d.	23s. 1½d.
		Box of 10 vials
3·0 mega units	13s. 4½d.	133s. 9d.

'Distaquaine' *Fortified* (brand)

	Single vial	Box of 5 vials
0·4 mega unit (3 + 1)	2s. 4½d.	11s. 10½d.
1·2 mega units (9 + 3)	5s. 10½d.	29s. 4½d.

'Distaquaine' *Suspension* (brand)

	Single vial	Box of 10 vials
10 ml. (3 mega units)	14s. 0d.	140s. 0d.

Streptomycin (*Sulphate*) and **Dihydrostreptomycin** (*Sulphate*)

	Single vial	Box of 5 vials
1 gramme (1 m.u.)	4s. 3d.	21s. 3d.
5 grammes (5 m.u.)	19s. 0d.	—

All prices subject to the usual discounts

THE DISTILLERS COMPANY (BIOCHEMICALS) LIMITED

SPEKE — *Owners of the trade mark 'Distaquaine'* — LIVERPOOL

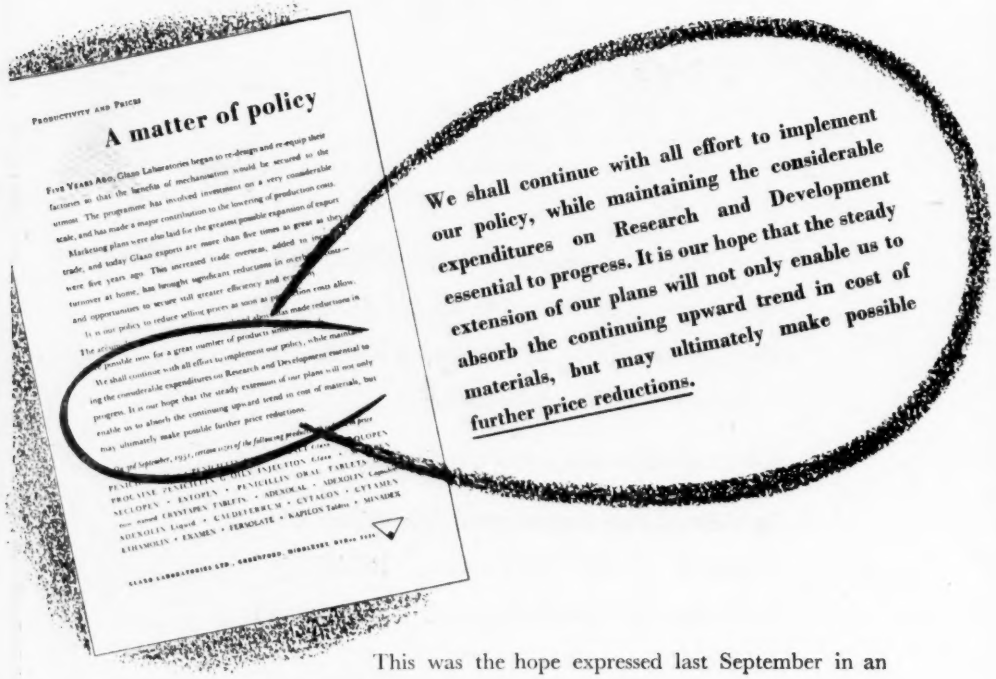
The Roche research chemists, following several years of intensive study, discovered that isonicotinyl hydrazine, 'RIMIFON,' is effective against tuberculosis.

Clinical trials are being continued.

In view of the urgent need for wider confirmation of this early work, 'RIMIFON' has been made available to all hospitals and tuberculosis centres.

ROCHE PRODUCTS LIMITED

a promise kept...


PRODUCTIVITY AND PRICES
A matter of policy
We shall continue with all effort to implement our policy, while maintaining the considerable expenditures on Research and Development essential to progress. It is our hope that the steady extension of our plans will not only enable us to absorb the continuing upward trend in cost of materials, but may ultimately make possible further price reductions.

This was the hope expressed last September in an announcement of price reductions for nineteen Glaxo products.

That hope is now fulfilled: on 28th April the prices of the products listed below will be substantially lowered . . . the *ninth* reduction in Glaxo penicillin prices since 1946, the *third* reduction in Glaxo streptomycin prices since 1949.

The following Glaxo products are reduced in price on 28th April, 1952:

PENICILLIN *Glaxo* • ESTOPEN • SECLOPEN • MYLIPEN • PROLOPEN

PROCAINE PENICILLIN G OILY INJECTION *Glaxo* • PENICILLIN OILY INJECTION B.P. *Glaxo*

CRYSTAPEN ORAL TABLETS • CRYSTAPEN OINTMENT • HIGH POTENCY CRYSTAPEN OINTMENT

MYSTREPTON OINTMENT • STREPTOMYCIN CALCIUM CHLORIDE *Glaxo*

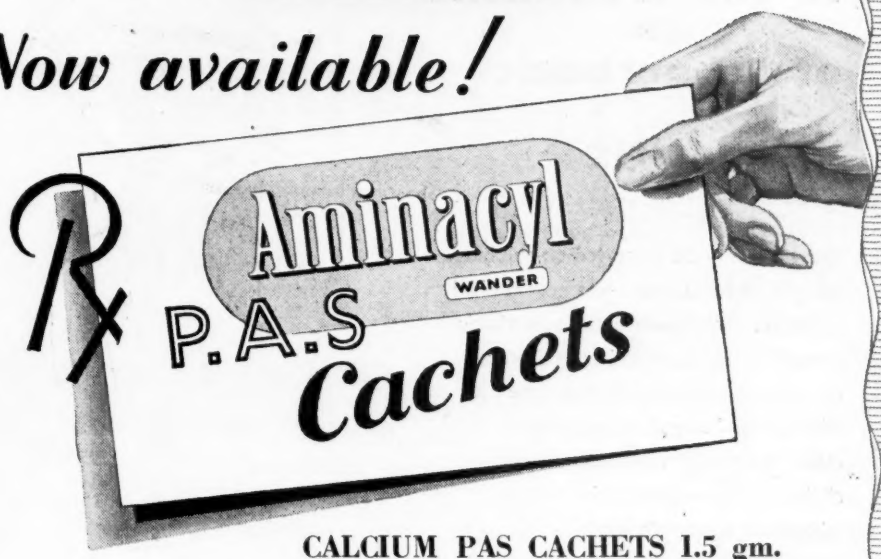
DIHYDROSTREPTOMYCIN SULPHATE *Glaxo* • HIGH POTENCY OSTELIN TABLETS

CALDEFERRUM TABLETS • KAPILON TABLETS

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX BYRon 3434

CHEMOTHERAPY OF TUBERCULOSIS

Now available!



CALCIUM PAS CACHETS 1.5 gm.
SODIUM PAS CACHETS 1.5 gm.

For Convenience of Physicians requiring widest choice of administrative forms of PAS, the House of Wander announces that 'Aminacyl' PAS Cachets have now been added to its already established 'Aminacyl' range of Calcium and Sodium PAS products.

'Aminacyl' Cachets are a well tolerated and convenient form for both institutional and domiciliary use. Their therapeutic performance is entirely comparable with that obtained with other already recognized forms of 'Aminacyl' PAS.

PACKINGS:—

'Aminacyl' Cachets of 1.5 gm. *Calcium* PAS : Tins of 100 and 500
'Aminacyl' Cachets of 1.5 gm. *Sodium* PAS : Tins of 100 and 500

The 'Aminacyl' range of PAS specialities also includes Calcium PAS and Sodium PAS bulk powder; Sodium PAS ampoules for topical and ophthalmic use; Calcium PAS and Sodium PAS Dragées; Calcium PAS Granulate.

Further information from the Medical Dept.,
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NEW ZEALAND: A. Wander Ltd., Christchurch.
INDIA: Grahams Trading Co. (India) Ltd., 16, Bank Street, Bombay.
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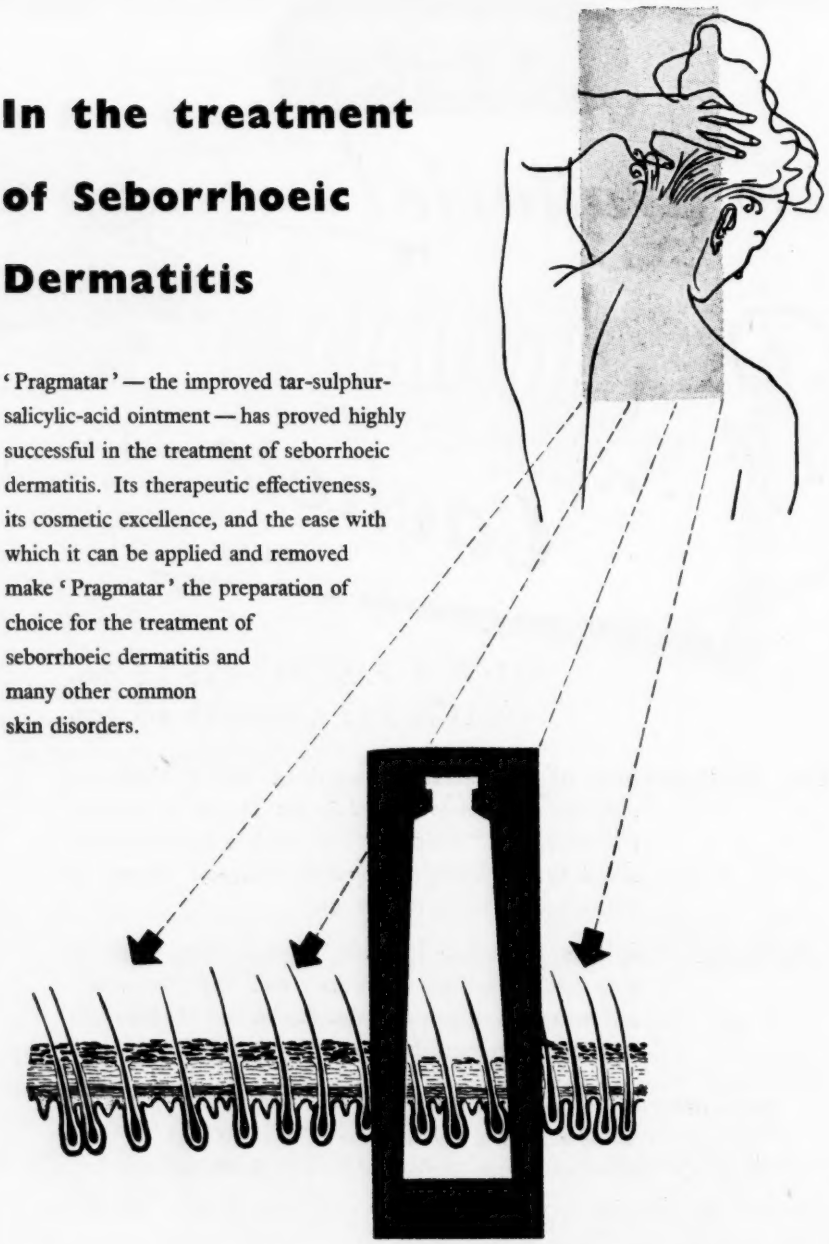
M.370

In the treatment of Seborrhoeic Dermatitis

'Pragmatar' — the improved tar-sulphur-salicylic-acid ointment — has proved highly successful in the treatment of seborrhoeic dermatitis. Its therapeutic effectiveness, its cosmetic excellence, and the ease with which it can be applied and removed make 'Pragmatar' the preparation of choice for the treatment of seborrhoeic dermatitis and many other common skin disorders.



Issued in 1-oz. collapsible tubes

'Pragmatar'

the improved tar-sulphur-salicylic-acid ointment

MENLEY & JAMES, LIMITED, COLDHARBOUR LANE, LONDON, S.E.5

for Smith Kline & French International Co., owner of the trade mark 'Pragmatar'

PRP127

3 points for 'DURACILLIN A.S.'

TRADE MARK BRAND

PROCAINE PENICILLIN-G AQUEOUS SUSPENSION 300,000 UNITS PER CC.

READY TO INJECT — Is a stable aqueous suspension needing only gentle agitation before injection. Dry syringe and needle not essential

DAILY DOSES ADEQUATE — In most infections a daily dose of 1 cc. will secure adequate tissue concentrations

STABLE AT ROOM TEMPERATURE — Refrigeration not necessary. Is stable for twelve months at 60 F

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Parenteral Liver Therapy

The Spekker Absorptiometer

Pioneer research work into the preparation of liver extracts for parenteral use has resulted in a product characterized by:—

1 *Conservation of naturally-occurring Vitamin B_{12}**
2 *Great potentiation of activity resulting from the process of proteolysis.*
3 *Minimal pain on injection.*
4 *Relative freedom from sensitivity reactions.*

* Each ml. of Neo-Hepatex contains in excess of 12 μg. of naturally-occurring Vitamin B_{12}. No Vitamin B_{12} from extraneous sources is added to Neo-Hepatex.

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Further information on request from:
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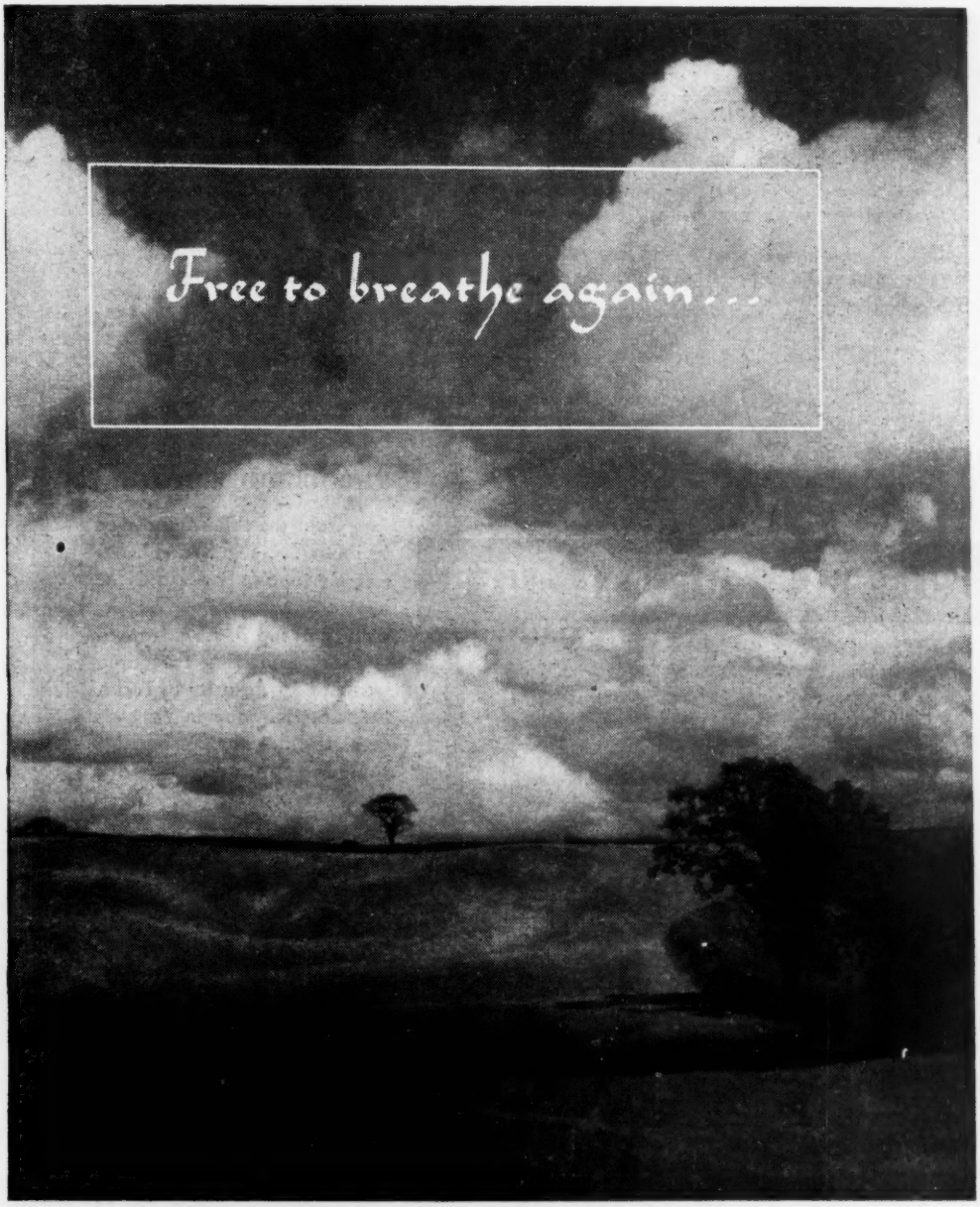

FOR THE RELIEF of bronchial asthma, a choice of 'Neo-Epinine' preparations is available. Almost immediate relief is obtainable by oral inhalation of No. 1 Spray Solution, a plain 1 per cent aqueous preparation. The 20 mgm. compressed products, placed beneath the tongue, act within 5-10 minutes. Stubborn cases need oral inhalation of No. 2 Compound Spray Solution which contains 1 per cent of drug with 2 per cent of papaverine and 0·2 per cent of atropine methonitrate.

'Neo-Epinine' BRAND
ISOPRENALINE SULPHATE
IN THE TREATMENT OF ASTHMA

BURROUGHS WELLCOME & CO. (THE WELLCOME FOUNDATION LTD.) **LONDON**

SUITABLE FOR ALL AGES

THROUGHOUT LIFE...

from the child to the aged or infirm . . . gentle, non-habit-forming Cascara Evacuant is the ideal tonic laxative. This palatable, concentrated preparation of Cascara Sagrada — the drug introduced to medicine by Parke, Davis & Company in 1877—is perhaps still the most acceptable remedy for constipation.

It is especially useful in infantile constipation, in convalescence, during pregnancy and for nursing mothers.

In bottles of 1½, 4, 16 and 80 fluid ounces

Cascara Evacuant

PARKE-DAVIS

THE IDEAL TONIC LAXATIVE

PARKE, DAVIS & COMPANY, LIMITED · HOUNSLOW · MIDDLESEX

inc. U.S.A.

290

AFTER FIFTY-SIX YEARS *

SIR JAMES LEARMONTH
K.C.V.O., C.B.E., Ch.M., LL.D. Glasg., F.R.C.S.E., Hon. F.R.C.S.

REGIUS PROFESSOR OF CLINICAL SURGERY AND PROFESSOR OF SURGERY, UNIVERSITY OF EDINBURGH

PERHAPS the most hallowed place where a surgeon may pause to meditate for a moment is before the arch behind the lecture-theatre in the Sorbonne, upon which it is recorded so simply and yet so utterly adequately, "Here a great Englishman was embraced by a great Frenchman." This meeting between Lister and Pasteur was symbolic of the interdependence of surgery and sciences other than surgery, an interdependence so near Lister's heart that his presidential address to the British Association in 1896 was devoted to it. It seemed to me not unfitting that fifty-six years later I might include in my oration some consideration of the influence of Lister's familiarity with other scientific disciplines upon his life and upon his work; that I might recall Lister's accounting of the contributions made to surgery by other sciences; and that I might record, with their implications for the future, some of the contributions to surgery made by these sciences since Lister's time.

In any such accounting, whether in Lister's time or now, the number of operative contributions falls short of the potential number. The reasons for this deficit are well known. The majority of contributions have their origin in the discovery of some new fact or process in a laboratory. It may take some time for such a discovery to be accepted in its own discipline, a delay which Trotter attributed to "an ingrained quality of the mind," and therefore often an inevitable delay. In any branch of science which may have practical applications there is a possibility of further delay between the acceptance of the discovery and its incorporation into the practice of its own science, or into the practice of related sciences. In medicine this latter delay is often more apparent than real, because very properly time has been spent in making controlled experimental and clinical trials of the possible applications of the discovery.

Lister's own innovation was derived from the laboratory. Its general adoption was retarded by delays of both categories, which provided almost the only vexation that disturbed the serenity of his long life. But although the difficulties which beset his innovation tried Lister's patience, they did not obscure in his mind the two tasks of any innovator. These were so clear to him that they ordered his whole professional life. His first task was to convince men of his own era who held other views; at the outset the verdicts of his colleagues upon his work were seldom equitable. "A froward retention of custom," wrote Bacon, "is as turbulent a thing as an innovation." Lister's second task was to train his pupils in the right way from the first. In this connection it must be remembered that Listerism was a break of considerable violence in the continuity of the practice of surgery. Although nowadays it may seem to us to have been a relatively simple exercise, in the '70s of last century compliance with Lister's technique imposed upon both teacher and taught a series of rigid "dos" and "don'ts" unfamiliar in operating-theatre and ward. To offset these irksome difficulties Lister had one conspicuous advantage. His was a great crusade. Unlike many crusades, which winnow out from the ranks of their supporters men and women of sufficient calibre to direct them, the crusade against wound infection had from its very beginning a leader worthy of it, a leader whose high intellectual stature stamped the crusade as of first importance.

One subsequent difficulty may be noted. Delay in working advances in medicine into the fabric of human experience, and especially the delay which retarded Lister's innovation, has produced in the minds of a minority of laymen an illogicality which, I imagine, most of us have met. Because formerly (and sometimes quite long ago) certain therapeutic procedures were at first not accepted by our profession, but later came into general use, this minority continues to believe that the only barrier to the immediate acceptance and useful application of every suggested procedure is the blind conservatism of physicians and surgeons, however bizarre the procedure, however unproven the claims made for its efficacy. That such an illogical idea can be seriously entertained is a sad commentary on the habits of thought of this small but often enough vociferous minority.

Lister's Career

Let me now turn to my first topic—the effect upon Lister's work of his familiarity with other sciences. Looked at with the eyes of 1952, the design of Lister's professional life is clear. As has been pointed out by Sir Robert Muir (1933), a previous Lister Orator to whose teaching and inspiration I owe much, Lister's work falls naturally into periods, each of which must be considered in perspective, and also partly in some detail.

1852–1860

(UNIVERSITY COLLEGE HOSPITAL AND EDINBURGH)

The first period—from just a century ago to 1860—was devoted to the study of fundamental physiological and pathological problems by the available laboratory methods. Lister ranged widely, but without overdispersing his efforts. To this period belong his researches on inflammation, on the pigmentary system of the frog, on coagulation of blood, and on the nervous control of blood-vessels. The results of these investigations were published in a series of important papers.

It does not matter that not all the conclusions which Lister recorded in these papers were correct, although there are critics—to be sure second-rate—who think that such mistakes are serious. The essential quality in an investigator is the ability to think of something to investigate, provided that his observations are made as accurately as is possible at the time. As F. C. Bartlett has recently emphasised, the process by which his observations are pieced together and elaborated provides a better basis for estimating the intellectual power of an investigator than do any conclusions he may reach, however new or even revolutionary they may be. The correct outlook of the wise critic has been concisely stated by G. M. Young: "Errors are opinion in the making."

From the first—and Lister was only 33 years old at the end of this period devoted solely to fundamental research—from the first his method never deviated from the most important tactic in the experimental approach: to set clear and limited problems. From the first, he followed the Aristotelian method of asking himself questions which could be so answered by the experiments he designed as to provide the data required for the solution of these problems. From the first, he pieced together and elaborated these data with the greatest insight and clarity. From the first, therefore, he reached his full scientific stature. As examples of Lister's pursuit of this tactic, let me describe briefly two of his investigations. The conclusions of his important paper on the parts of the nervous system which regulate the *contractions of arteries* embody the results of a piece of pure physio-

* The Lister Oration delivered at the Royal College of Surgeons of England on April 4, 1952. The lecture will also appear in the *Annals* of the college.

logical research which did not find immediate clinical application :

"(1) That, of the nervous centres usually recognised, the cerebrospinal axis is the only part which regulates the contractions of the arteries of the webs : this function being apparently exercised by the whole length of the cord and the posterior part of the brain, operating through fibres which arise from the same region of the cord as do those through which sensation and motion are effected in the hind legs."

We know now that vasoconstrictor fibres have a limited origin from the spinal cord, and do not arise from its whole length. We owe this refinement of knowledge to the work of British physiologists on animals, and to accurate and controlled observations made by a large number of surgeons during and after division of sympathetic nerves or spinal roots in man.

"(2) That there exists within the limb some means, probably ganglionic, by virtue of which the fibre-cells of the circular coat of the arteries may contract in concert with each other, independent of any ganglia contained in the trunk."

This conclusion remains substantially true, although we know now that the mechanism is not ganglionic, but a fundamental property of the smooth muscle in the middle coat of arteries. In the treatment of injuries the existence of this mechanism has sadly plagued surgeons by obtruding itself as arterial spasm. This is unaffected by freeing the contracted artery from the control of its extrinsic nerves ; only recently it has been shown by J. B. Kinmonth to be abolished in certain animals by the local application of a solution of papaverine. If this be true in man also, the method cannot be too quickly incorporated in the surgery of trauma.

"(3) That the local coördinating apparatus, though capable of independent action in special conditions of direct irritation, is, under ordinary circumstances, in strict subordination to the spinal system : while a remarkable provision exists for the maintenance of this control, notwithstanding almost complete severance of nervous connection between the cord and the limb."

When it is remembered that Lister was writing before adrenaline was discovered this statement also was broadly true. It provides the hypothesis upon which are based operations for the division of sympathetic vasoconstrictor nerves as part of the management of certain diseases of arteries, and it also provides an explanation for the clinical observation that the vasodilatation immediately following these operations is somewhat reduced by the passage of time.

On the other hand, in his first work on the *coagulation of blood* Lister deliberately chose the experimental laboratory in which to seek an explanation for a clinical phenomenon : he shared the view of his contemporary Huxley, that "experiment is artificial observation." He had amputated a child's leg for gangrene complicating scarlet fever, and within the normal popliteal artery he found a thrombus. In a series of ingenious experiments upon animals, he showed that blood remained fluid in a segment of vein as long as the endothelium was intact, but coagulated after transfixion of the vein by a needle—a procedure which injured the endothelium and introduced a foreign body into the blood. Perhaps not a complete explanation of the process of coagulation : but how much nearer the truth than any previous hypothesis.

There is no doubt that any errors in these beautifully designed and executed pieces of research were but "opinion in the making." As did Lister then, we must work today with the knowledge and with the tools to hand, and it is idle to demand finality in the results of such investigations. Whether or not we now accept Lister's conclusions, we retain undiminished respect and admiration for his genius, his industry and his steadfastness of purpose. There is another important aspect of Lister's work during this first period which must command our attention. Skilled as he was in the tactics of research, he added to his intellectual stature by limiting his strategic aims. It cannot be too often repeated that in his choice of problems a grand design is clear : he wished to become familiar with every aspect of the response of tissues to injury. No other knowledge could have been more essential to fit him to perfect his subsequent clinical work for practical use.

1860–1869

UNIVERSITY OF GLASGOW

In these days when there is much talk, and often loose talk, about the advantages and disadvantages of specialisation, it is of interest to try to determine how Lister ordered his clinical and operative commitments. First, from the evidence of those who were associated with him during his active career there is no doubt that he would have agreed that every would-be surgeon must be reasonably adept in carrying out those practical manœuvres which are common to all surgical operations. Secondly, he knew that the basis of broad operative experience depends upon familiarity with the steps of a sufficient number of standard procedures ; in Lister's early career these were not numerous. Thirdly, as a scientist he must have been keenly aware that conclusions drawn from a number of cases in which a given procedure has been used are valid only if each procedure has been performed with the highest possible technical skill.

The evidence is that Lister completed this practical experience during the early years of his tenure of the chair of surgery in the University of Glasgow which formed the second period of his life's work. Soon after he introduced his antiseptic methods in the later part of this period, Lister must have realised that for the first time a vast number of desirable new surgical procedures could be safely performed. He resisted the temptation to make this use of his work, although he must have been aware of the great wealth that it would have assured him. Instead he confined himself largely to the surgery of injury and to certain aspects of what we would now call orthopædic surgery, because such cases provided him with the most suitable conditions for refining his methods. For the rest of his life, so far as I can find out, Lister followed the same plan—and how wise that was. He knew that the brake upon the production of original work is not routine, that excuse of the unproductive, but too much routine. He knew that, in the science of surgery, to try to be original all the time is to neglect the wider and equally important duties of translating original work to practice, of shortening the time needed for this and of narrowing the gap between the laboratory and the ward. "It is the second-raters," wrote C. E. Montague, "who pursue novelty at all costs."

1869–1877

(UNIVERSITY OF EDINBURGH)

Certainly Lister continued to restrict the scope of his clinical work when he returned to Edinburgh and entered upon the third period of his career. This was devoted to the refining and simplification of his methods and to the beginning of his campaign to disseminate them throughout the world of surgery. During these years his contributions to surgical literature reflected this purpose. They contained careful statements of his views and of his clinical practice ; patient explanations of errors made by some who imagined, often sincerely enough, that they were following his directions ; and announcements of changes in his methods. Over and over again the pattern was repeated. A good physiologist, he had already realised the effectiveness of summation of stimuli.

In order to acquaint you with the scope of Lister's clinical work in the eight years during which he was Regius professor of clinical surgery, I have made an analysis of the patients admitted to his care. The records were not always complete, but usually it was possible to identify diagnoses.

When Lister took over wards in the Royal Infirmary of Edinburgh the official number of beds in them was 54—Syme had had 70—but as often as not there were up to 16 extra beds and there might also be mattresses upon the floors. In the eight years there were 2283 admissions, which I have classified in a quite arbitrary way:

A. *Emergencies*

1. Wounds and bruises	200
2. Simple fractures and dislocations	239
3. Compound fractures and dislocations	61
4. Head injuries	68
5. Infections of soft tissues	139
6. Burns	44
	751 = 32·9%

It does not appear that Lister selected these cases, but they provided him with abundant material for perfecting his methods of dressing wounds. His operative technique was already so secure that when it seemed to him necessary he exposed *ununited fractures* and treated them successfully by suture or by pegging with bone; perhaps these were devices which he could have pursued more exhaustively, to the immediate benefit of a larger number of selected patients. Of the 61 *compound fractures and dislocations*, amputation was required in 14; the records were not detailed enough to enable me to determine in each case the indication for amputation, but certainly primary destruction of tissue was a much more common indication than superadded infection.

B. *Cases either attracted to or selected by Lister*

1. Tuberculous osteo-arthritis	381
2. Pyogenic osteo-arthritis	160
3. Varicose ulcers	105
4. Deformities	60
5. Tumours of the breast	110
6. Tumours of bone	53
7. Tumours of the tongue, cheeks, and lips	70
	939 = 41·1%

The first three types of lesion seem to have been deliberately chosen by Lister in order that he might test methods of dressing wounds, both to prevent secondary infection (*tuberculous osteo-arthritis with abscess formation*) and to eradicate existing infection (*pyogenic osteo-arthritis* and *varicose ulcers*). As early as 1872 he employed carbolic acid as a sclerosing agent for *varicose veins*, another fruitful field in which he merely pointed the way. *Deformities* (for which he practised osteotomies and tenotomies) and *tumours of the breast* gave him numerous opportunities for entering the tissues by his antiseptic operative technique, and for making extensive dissections. His interest in *tumours of bone* and in *tumours of mouth and tongue* he had as a legacy from his predecessor Syme, "whose teaching," he said in his gentle way, "I do but reflect."

C. *The "General Run" of the surgery of the times*

1. Anorectal conditions (piles, fistulæ)	96
2. Genito-urinary conditions (hydrocele, stricture, calculus, tuberculosis)	154
	250 = 10·9%

To deal with *strictures of the urethra* he invented the set of bougies which goes by his name and superintended its forging; and he practised suprapubic lithotomy for *stone in the bladder*.

D. *Miscellaneous conditions* 258 = 11·3%

The most striking feature of this group was the diversity of the conditions. It included a surprisingly large number of *tumours of the parotid gland*, although I have been unable to trace any other evidence that Lister had a special interest in this difficult anatomical problem.

E. *Curiously infrequent types of case*

1. Abdominal conditions	11
2. Hernias	20
3. Tuberculous adenitis	17
4. Primary amputations	14
5. Goitre	10
6. Aneurysms	7
7. Senile gangrene	6
	85 = 3·8%

It seems clear that Lister did not deliberately seek to deal with *abdominal conditions*, and it is known that he passed on to another surgeon many which came his way. The following 11 cases appeared in his ward journals: ruptured gastric ulcer, "peritonitis," "pantyphlitis," abdominal tuberculosis, ovarian cyst (2), carcinoma of stomach, carcinoma of colon, carcinoma of rectum (2) and "carcinoma of mesentery." F. M. Caird, who attended his wards from 1874 to 1877, recorded that Lister did not care to open the peritoneal cavity, for two reasons, the chilling action of carbolic lotion and its possible irritating effect; and that he passed on abdominal cases to Dr. Thomas Keith, whose results he much admired. Caird also stated that Lister operated boldly on *hernia*, performing radical cures and resecting bowel; yet at a time when hernia and strangulated hernia were common conditions, in eight years only 20 cases of hernia appeared in his journals—12 femoral of which 3 were strangulated, 7 inguinal of which 2 were strangulated, and 1 umbilical. At this time also *tuberculous adenitis of the neck* was common and it seems strange that so few cases were admitted to his care of a type whose complications would have responded to Listerian dressing. The *primary amputations* were for the end-results of injuries, and 6 of the 14 operations involved one or more fingers. *Goitre* has been placed in this group to enable me to record that Lister "scooped out" a bronchocele in 1872 and excised a "nodule" in 1875; he maintained his interest in goitre, and relieved dyspnoea by scooping out masses of carcinomatous tissue; but from correspondence in the possession of the Royal College of Surgeons of Edinburgh it is clear that he was as interested in maintaining the cleanliness of the subsequent fungating wounds.

It is more than strange that Lister's experimental and clinical interest in the problem of ligation of large arteries was not pursued more actively in his wards at a time when *aneurysm* was relatively common. The 7 cases of vascular disease included 5 popliteal aneurysms, 1 abdominal aneurysm, and 1 varicose aneurysm of unspecified origin. *Senile gangrene* was not so common in Lister's time as it is now that people live longer.

1877–1896

(KING'S COLLEGE, LONDON)

The fourth and final period includes the time Lister spent at King's College. Here his mission was apostolic, and there is little doubt that the move from Edinburgh was undertaken to favour that purpose. He knew that it was for the ultimate good of his crusade to concentrate uninformed criticism and especially ill-natured criticism upon himself, because such criticism too long directed against the same person or against the same proposition steadily loses point.

The story of this period is known to you all: today the only phase that we need to recall is Lister's ultimate triumph, and the distinction which it brought to British surgery. Perhaps as good an indication as any of the enduring success of Lister's crusade is to be found in the tribute of no less a giant than Rutherford Morison, written as recently as 1927:

"Present fashion in surgery dictates a dry technique and I followed it until two surgical calamities (gas gangrene) pulled me up. Both occurred in clean cases, months apart, in different hospitals. Our sterilising machinery was of proved efficiency, nothing but instruments entered either wound, and both patients died within three days. In thousands of operations performed on antiseptic lines, I had never had such an experience. The calamities occurred in the 300 to 500 cases in which the dry method was practised."

Even fifteen years after Lister's death, his carbolic spray may be said to have obscured Morison's usually clear view.

I have heard it contended—although not in this country—that during his professional life and particularly during this fourth period Lister ought to have turned his highly developed powers of research to more than one major problem, and that if he had done so his genius was such that surgical science would have advanced faster than it did then and subsequently. The contention is plausible enough to require examination. There are at least three possible reasons for Lister's decision. He probably realised that the validity of deductions from the results of surgical procedures does not differ from that of deductions from experiments in the sciences, in that both depend in part upon the elimination of as many variables as possible; only by limiting his problems and his operative work could this condition be observed. We may even hazard that with his mathematical knowledge he recognised the value of a large number of similar experiences in eliminating the influence of chance upon his conclusions. But I think that the major reason for Lister's decision to limit the scope of his work was that he realised the practical advantage of short steps between idea and application, and chose to give himself this advantage by personally shepherding his innovation through all its fascinating stages—the *pure science* of his laboratory, the *investigations* in his wards, the *technology* of application on an ever-increasing scale in his own wards and in the wards of his converts and of his pupils, and the determined *enterprise* to bring his methods to the notice of surgeons all over the world. If this can be called specialism, surely it is the right sort: to distil one's experience, to publish it for the information of one's colleagues, and so, by sharing one's special knowledge, to encourage the disappearance of one's own specialty.

Lister's Scientific Creed

Lister relinquished his chair at King's College in 1893 and gave up private practice in 1896, the year of his presidential address to the British Association. Since this address was given at the end of his professional career, at a time when he was still fresh from the practical problems of surgery, it may be regarded as his scientific creed, and thus it provides the substance of my second topic.

The title of the presidential address was On the Interdependence of Science and the Healing Art. I have found it instructive to consider the import of this address under two headings—its inclusions and its omissions.

THE INCLUSIONS

Almost at once Lister referred to the discovery of röntgen rays, at that time only a year old, and cited examples of its clinical importance, some of which must have been a little beyond the comprehension of even highly intelligent laymen. He described the use of the fluorescent screen, and warned that over-exposure to the rays might be irritating. Moreover he clearly foresaw the extended use which would come to be made of X rays, for he concluded that there was "no reason to suppose that the limits of the capabilities of the rays in this way have yet been reached."

Next Lister noted that the year 1896 was the jubilee of anæsthesia in surgery and reaffirmed his confidence in chloroform: even as a dresser, he had been a little bewildered if it did not act perfectly.

Naturally enough, a large part of the address was a consideration of the steps by which he had arrived at his antiseptic system. Lister was always careful to acknowledge his indebtedness to Pasteur. He was able to speak of bacteriology as a science, for Koch's book had been published in 1878. Immunology had made considerable progress, and he described how protection could be provided against rabies and diphtheria. He was alive to the light thrown by the zoologist Metchnikoff on the defensive rôle of leucocytes, the emigration of which had been described by Cohnheim. He permitted himself a filial statement on the place of the microscope in the investigation of the morphology of bacteria: "The improvements of the microscope, based on the principle established by my father in the earlier part of the century, have apparently nearly reached the limits of what is possible." Other forms of microscope—for example the electron microscope—were far in the future.

THE OMISSIONS

It is of some interest that the implications for surgery of the rapidly growing science of organic chemistry seem for Lister to have been concerned only with the choice and preparation of substances for use in dressings. By synthesising urea in 1828, Wohler had laid the foundation of both qualitative and quantitative analyses of organic substances and of the multiplication of these substances in the laboratories of organic chemists and pharmacologists. However Lister's views on the pharmacology of carbolic acid were utilitarian and confined to its physical properties: "The energy of action of any substance upon the human tissues depends not only upon the proportion in which it is contained in the material used as a vehicle for its administration, but also upon the degree of tenacity with which it is held by its solvent." This purely arithmetical view is the stranger, because before Lister left Edinburgh for King's College he must have been aware of the great potentialities inherent in the coöperation of chemist and clinician; his colleagues Crum Brown of the chair of chemistry and Fraser of the chair of materia medica had shown that the addition of a methyl group to certain alkaloids conferred on the new compounds a curare-like action. Yet when a case of tetanus was admitted to his care, the ward journal recorded that Professor Lister ordered—of all drugs—the Calabar bean. Moreover although Claude Bernard had begun to emphasise the importance of the constant composition of the body-fluids as early as 1878, his ideas took even longer to permeate surgical practice than did Lister's; indeed Lister does not seem to have been aware of them.

Contributions Subsequent to Lister's Address

In dealing with my third topic, it will be impossible to make a complete survey of advances in the sciences which have been of direct or indirect assistance to surgeons since Lister's address in 1896; but before making my selection I should like to record one other ever-increasing debt.

This is to the profession of *nursing*, at once an art and a science. The existence of a highly trained and devoted body of women and men is inseparable from and indispensable to the practice of modern surgery; in both ward and operating-theatre it is never easy to draw a dividing line between surgical care and nursing care, nor is it desirable to attempt to do so, for they are one. Moreover a belief that I have now held for more than thirty years has a factual although perhaps not a strictly scientific basis: that when on occasion formal treatments and remedies fail, it is possible for a patient to be nursed back to life and health.

PHYSICS AND CHEMISTRY

Only two years after Lister made his almost dramatic reference to röntgen's discovery, Walter Cannon, while still a medical student, introduced the use of a radio-opaque medium to study the movements of the alimentary tract, a method of physiological investigation soon to be adopted for diagnostic purposes. The principle has since been applied to the study of normal and patho-

logical conditions of the urinary tract, the biliary apparatus, the blood-vessels, the subarachnoid space, and the respiratory tract. Physics has provided us with devices through which many of the cavities of the body can be directly inspected; although occasionally some pessimist warns us against them, it is important to remember that the clinician's own eyes and own hands are still being as effectively used and as effectively trained when he is employing such aids to diagnosis as when they were not available to him. Physics has already provided for us a variety of instruments for making and recording biological measurements of great accuracy; and, most hopefully for the future, physicists are willing to design for us apparatus for investigating almost any physiological function which we may designate.

The therapeutic effect of radium and X rays on new growths has become the separate specialty of radiotherapeutics with its vast complexity of apparatus, the capabilities of which have not yet been assessed. In recent years the development of atomic physics has permitted us to trace the distribution and fate of various elements in the living body; some of these elements produce radiations which favourably influence certain processes of disease, and these we can distribute by the blood-stream to the affected parts.

The debt of anæsthetists to chemistry has become infinitely greater with the advent of the anæsthetic gases, of local and spinal anæsthesia, of intravenous anæsthesia, and recently of what Gillies has called "physiological trespass" to provide a bloodless field of operation by the deliberate production of hypotension. This last refinement would have greatly interested Lister, because he would have recognised in it an extension of his work on the parts of the nervous system which regulate the calibre of arteries.

BACTERIOLOGY

As has been so fascinatingly described by a previous Lister Orator, who played a chief part in the near-drama (Florey 1945), bacteriology and organic chemistry have given us those remarkable substances, drugs of the sulphonamide group and antibiotics derived from lowly forms of vegetable life, so potent that within a decade the mortality and morbidity resulting from many infective processes were reduced to an almost unbelievably low incidence. Lister would have rejoiced in modern chemotherapy; but he would *not* have used it to offset any lowering of standards in his techniques. Methods of immunology have made notable progress since 1896; one index may be recorded of their efficiency when employed on a large scale. During the period from "D-day" to "VE-day," fewer deaths from tetanus complicating military wounds occurred in the thoroughly immunised British Liberation Army than occurred from tetanus complicating accidental injuries in the unprotected population of Scotland.

PHYSIOLOGY, BIOCHEMISTRY, AND PHARMACOLOGY

Perhaps our longest list of recent indebtedness is to the linked sciences of physiology, biochemistry, and pharmacology; a burden of debt to some extent offset by the contributions of surgeons to these sciences, partly from observations made possible as a result of the extension of surgical procedures, for example to endocrine glands; and partly as a result of an ever-growing biological approach on the part of surgeons to the pathological problems confronting them. There is the science of endocrinology, beginning with the short announcement of Oliver and Schafer On the Physiological Action of Extract of the Suprarenal Capsules, and still expanding rapidly. There are the anticoagulant drugs, which have overcome difficulties that Lister investigated with anxious solicitude. There is the vast accumulation of knowledge of nutrition from "vitamins" to post-operative nitrogen katabolism; knowledge which has so profoundly and advantageously affected our treatment of injuries and our preoperative and postoperative management of surgical conditions; knowledge which has confirmed the view of Claude Bernard on the supreme physiological importance of his *milieu intérieur*. There are the diverse products of the pharmacological laboratories, where molecules are made to do the bidding of the research-worker.

PSYCHOLOGY

Finally, in my work in Edinburgh I have had so much help from psychologists that it would be ungrateful not to add to my list the better understanding which they have given to us of the immediate clinical importance of the mental processes of surgical patients, a matter partly dealt with in the memorable address of the last Lister Orator (Jefferson 1949).

Lister's Achievement and its Lesson

These then are some of our present debts to the fundamental sciences, and bewildering they are in both number and complexity. Fortunately we know Lister's personal views on the relative importance of contributions to surgery, and to these I shall return.

First, since it is the pious duty of each Orator to pay his humble tribute to the memory of Lister, I must try to decide the way in which we, his debtors, should measure his achievements. Bacon proposed one standard:

> "If a man perform that which hath not been attempted before, or attempted and given over, or hath been achieved but not with so good circumstance, he shall purchase (= acquire) more honour than by effecting a matter of greater difficulty or virtue wherein he is but a follower."

This concept sets a standard of perseverance, and of craftsmanship which in surgery includes much more than mere manual dexterity; and measured by it there can be no doubt of Lister's place in surgery. But the standard cannot be used as the sole measure of Lister's achievement: his contributions ranged far beyond surgical craftsmanship, to a surgical principle.

Now the value of a principle is the greater the larger the number of problems to whose treatment it can be applied. Upon a comprehensive principle it is not possible to put a precise value: one might as well try to measure an emotion or an abstraction. There are few principles in any of the sciences as fundamental as is that of Lister in surgery, for it is applicable to every problem involving the deliberate making of a wound, and to every problem involving the prevention or eradication of infection in a wound. In making this statement I give no weight to the rather tawdry attempts which have been made to separate the "antiseptic" from the "aseptic" era. Those who try to do so have not studied Lister's papers: for example, his statement that "The part to be operated upon, then, being in an *antiseptic* atmosphere, if the finger is to be introduced into the wound . . . you must take special care that it is an *aseptic* finger." But even great principles must conform to one rule: they must be adaptable to changes in every related part of the whole body of knowledge. It is one of the glories of Lister that he realised the need for this constant adjustment of his principle, and that he communicated these adjustments to medical literature when he thought it timely. By this standard also his work was and is supreme.

It is therefore of great interest, and to my mind of compelling present importance, that there is indisputable evidence that these were not the standards by which Lister judged his own contributions to surgery. Towards the end of his public life and while still in full possession of his great intellectual powers, he remarked to the late

Professor Bulloch that if his works were read after his death, the papers most highly thought of would be that on the early stages of inflammation and that on the cutaneous pigmentary system of the frog. With universal agreement, Lister might have singled out his records of practical achievements: yet he chose papers in those fundamental sciences to which he had purposefully devoted himself while preparing for his life's work.

This Listerian ordering of values might well command the attention of those who are concerned with the training of the surgeons of the future. Lister would not have taken long to decide between on the one hand the opportunity of obtaining a knowledge of the preclinical sciences from textbooks or in the lecture-room, and on the other the opportunity of a period spent in the discipline of a laboratory, which included at least observation of research and at best active participation in it. I feel sure that Lister would have counselled that any policy of "staffing and training" which made it difficult or impossible to secure for recruits to surgery a training such as he himself had, would be imperilling the future of British surgery.

A great many surgeons can do what is at present wanted, and honourable and useful lives they lead. The training of at least a proportion of the surgeons of the future should be such that they have given some thought to what will be wanted before their professional lives are over. The next generation will see profound changes in surgical practice. The early advent of these and their intelligent use depend upon the early introduction and continued application to the ancillary sciences of young men now in training. Moreover, the Listerian outlook might perhaps influence, more often than it does, the present decisions of those whose duty it is to select from among many applicants surgeons to fill senior positions. Bacon stated the general principle to be used in making any senior appointment: ". . . expert men can execute, and perhaps judge of particulars, one by one: but the general counsels, and the plots and marshalling of affairs come best from those that are learned."

Within recent months the general problem of the scientific approach to medicine has been considered in addresses by the President of the Royal Society and the Secretary of the Medical Research Council; and it would be idle for me to recapitulate arguments which have the weight of their authority.

I believe that in training the surgeons of the future the attempt should be made to ensure that all are alive to the possible applications of advances in the related sciences: surgeons who do not possess this understanding will lack purpose. It would be wasteful and wrong to attempt to place upon surgeons the entire responsibility for making these applications; often they are matters of technology or even of production, which are not the surgeon's provinces. Nor is it necessary for each surgeon to be completely expert in all or even in any one of the ancillary sciences: his early training rarely provides an adequate basis for this, and in my experience a young physicist (for example) will quickly learn the physiological bases of problems in the solution of which he may be required to help. Indeed other scientists distrust doctors. "In designing a medical instrument," writes the biophysicist Stacy, "one makes it foolproof, then goes further to make it nurseproof. It is difficult to make the instrument doctorproof, for a doctor may carry a screwdriver in his pocket." Although it was written in jest—or at least one hopes so—there is possibly enough truth in this opinion to warn us surgeons, in this year of 1952, to pay more heed to our knowledge of the related sciences. I believe that their challenge should be met: how would it be best to do so?

The fundamental problem is to secure the acceptance by every citizen, medical and lay, of the proposition that the research of today, whether carried out in laboratory or in ward, is often the life-saving clinical care of to-morrow. This Lister knew, and for this he lived. In present circumstances, I believe that the many and complex problems still facing surgeons can best be approached in university hospitals; the clinical staffs of these should not be limited by a rigid establishment. The staff and wards of such a hospital should form with the staff and buildings of the university departments of all other related disciplines a single intellectual and geographical unit. Every contributor to this common weal—clinician, preclinician, and ancillary scientist—would be pledged, as was Lister, not to disease but to the patient. Here the sick would be tended with the broadest possible background of human relationships. Here every idea would be seminal. Here every idea might fructify a host of others. Here after proper trial in laboratory or ward every idea would find either ready application or quick rejection. Here would be the form of memorial that Lister would have thought best and liked best.

* * *

"The History of the world," wrote Thomas Carlyle, "is but the Biography of great men." However wide his perspective, however sweeping his range, each future historian must find a place for Joseph Lister. Lister, whose life's work changed for all time the lot of the surgically afflicted. Lister, whose life's work left us a shining beacon towards which each one of us may strive. Our Lister, to whom with thankful hearts and with gratitude for our heritage this day we pay our homage.

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CŒLIAC DISEASE: GASTRO-INTESTINAL STUDIES AND THE EFFECT OF DIETARY WHEAT FLOUR

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As a result of observations made in Holland, Dicke (1950) showed that patients with cœliac disease improved when wheat and rye flour were excluded from their diet. Weijers and van de Kamer (1950) demonstrated that there was a decrease in the fæcal fat under these circumstances and that the reintroduction of wheat flour, though not of wheat starch, into the diet led to deterioration.

The object of the studies reported in this paper was to establish the nature of the alteration in gastro-intestinal function in cœliac disease and to study the effect of dietary wheat flour on the syndrome.

Many different interpretations have been placed on the biochemical findings in cœliac disease. Methods have been developed in the study of adult idiopathic steatorrhœa which have defined the biochemical features

of the condition (Frazer 1951) and the first part of this investigation consists of the application of these methods to cœliac disease. The second part concerns the influence of wheat on the clinical condition and intestinal function.

Gastro-intestinal Function

Ten cases of cœliac disease, diagnosed on clinical, biochemical, and radiological evidence, were studied while on normal hospital diet (diet A).

METHODS

Assessment of fæcal fat.—The fæcal fat was measured by the daily fatty-acid method adapted from that described by Kamer et al. (1949). The patients received 40 or 50 g. of fat per day and the stools were collected daily.

Each 24-hour stool collection was made up to 1 litre with water and mechanically mixed for 1 min. A 10 ml. aliquot of the fæcal emulsion was saponified with 47 ml. of an alcoholic 3% KOH solution containing 0·4% amyl alcohol. The saponified mixture was cooled and acidified with HCl, and 50 ml. of petroleum ether added. The mixture was shaken well for 1 min. and allowed to settle.

A 10 ml. aliquot of the petroleum ether layer, to which a few drops of absolute alcohol had been added, was titrated with 0·1 *N* alcoholic soda or tetramethylammonium hydroxide, using thymol blue as indicator. The results were expressed as grammes of stearic acid. The daily totals of fæcal fatty acid were converted to 3-day sliding means and adjusted where necessary to correspond to a 40 or 50 g. fat intake.

Pancreatic enzymes.—Amylase, lipase, and trypsin were estimated in duodenal juice withdrawn by intubation.

Amylase was measured by the method of Ågren and Lagerlöf (1936), using soluble starch as substrate.

For lipase 1 ml. of olive oil was added to 5 ml. of phosphate buffer containing 0·5% bile salts at pH 7·8 in a 50 ml. stoppered conical flask. 0·1 ml. of duodenal juice was added and the mixture shaken for 30 min. at 37°C. It was then acidified and extracted with 20 ml. of benzene. A 10 ml. aliquot of the upper benzene layer was titrated with 0·1 *N* tetramethylammonium hydroxide in alcohol (Frazer, Sammons, and Thompson 1952).

For trypsin the method of Charney and Tomarelli (1947), with sulphanilamide azocasein as substrate, was used. The digestion was estimated colorimetrically.

Systemic hyperlipæmia.—10–20 g. of fat was given orally to the fasting child, and during the next five hours systemic hyperlipæmia was studied by means of the chylomicrograph technique (Frazer and Stewart 1939).

Absorption in the upper small intestine.—This may be measured in adults by a study of blood-glucose levels after the gradual administration of an isotonic glucose solution intraduodenally (Frazer, French, Thomas, and Thompson 1952). Oral glucose tests may give occasional false results because of variable gastric emptying, though they give some information about intestinal function. Only oral glucose tests were possible on our patients; 15–30 g. of glucose was given, the dose depending on body-weight, and the blood-sugar was estimated over a 3-hour period by the Hagedorn-Jensen method. The same dose was used throughout for any one child.

Radiography of the upper small intestine.—Examination of the intestinal tract was carried out with both flocculable and non-flocculating suspensions of barium sulphate, with particular reference to the small-intestine pattern (Astley and French 1951).

RESULTS

Clinical Assessment

The condition of the ten children conformed to the generally recognised clinical pattern of cœliac disease. About the first birthday, after a normal and uneventful infancy, a disinclination for food was associated with an insidious change in bowel habit. The stools gradually increased in frequency and became pale, bulky, and offensive. There was a steadily increasing anorexia, sometimes combined with vomiting, and the weight became stationary or decreased. In severe cases with emaciation, abdominal distension contrasted with considerable wasting of the buttocks and the limbs. At the same time a happy and contented infant slowly developed into a fractious, morose, apathetic, and extremely difficult child, well-nigh impossible to interest or satisfy. These striking changes in behaviour mirrored the physical and nutritional state and were one of the fundamental clinical features of the disorder. The clinical findings did not differ from those generally recognised in cœliac disease (Parsons 1932).

Biochemical and Radiological Assessment (see table I).

Fæcal fat.—The amount of fat in the stools of normal children taking 40 g. of fat per day averages 2 g. daily, and does not exceed 4 g. In all our cœliac cases the fæcal fat output was increased above normal on a standard intake. In seven cases daily fat-balances were carried out throughout their stay in hospital; they showed considerable variation in the fæcal output from day to day. In each case the figures quoted represent the average of a 10-day balance. It is realised that the fæcal fat may not be derived entirely from unabsorbed dietary residues. Other possible sources are cellular debris, excreted fat, and fat synthesised by intestinal organisms. In the patients we have so far investigated most of the fæcal fat appeared to be of dietary origin, since parallel changes occurred when the dietary fat was removed and reintroduced. Some increase of bacterial fat is to be expected in cœliac disease, however, because of the increased bacterial content of the stools.

Pancreatic enzymes.—In normal children over one year of age, amylase, lipase, and trypsin are always present; amylase may be deficient under this age. The normal ranges by the methods used are: amylase 2–8 units, lipase 2–6 units, trypsin 8–50 units. All the cœliac children showed normal levels of the three enzymes, with the exception of the two youngest, who showed slightly subnormal levels of amylase only, lipase and trypsin being normal.

TABLE I—RESULTS OF INVESTIGATION OF TEN CASES OF CŒLIAC DISEASE ON DIET A (WHEAT-FLOUR-CONTAINING)

Case no.	1	2	3	4	5	6	7	8	9	10	Average	Normal
Age (years)	3	3	2¼	6	4	1½	¾	6	3½	1¼	3	—
Fæcal fat (g. per day)	15·2	12·0	10·4	8·0	20·0	10·0	6·4	6	6	9	10·3	<4
Pancreatic Enzymes	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	..	..
Chylomicrograph (maximum increment in particles per field)	65	40	130	57	16	60	61	65	82	17	59	>150
Oral glucose (maximum increment in mg. per 100 ml.)	34	0	26	26	11	30	21	25	11	18	20	>40
Radiograph (water suspension)	F +++	F +++	F +++	F +++	F +++	F +++	Not examined	F +++	Not examined	F +++	..	..
Radiography (non-flocculable suspension)	D +++	D +++	D +++	D +++	D +++	D +++	D +++	D +++	D +	D +++	..	..

F = flocculation pattern seen with water suspension of barium sulphate.
D = wide dilated pattern seen with non-flocculable barium sulphate suspension

Chylomicrographs.—In healthy children the maximum increment in the chylomicron count exceeds 150 particles per standard field 2–3 hours after the meal. In all our cases the rise in chylomicron count was delayed and depressed. The average maximum increment was 59 and the range was 16–130.

Oral glucose-tolerance tests.—The usually accepted increment in normal children exceeds 40 mg. of glucose per 100 ml. of blood. In the cœliac cases, the average was 20 mg. per 100 ml. (range 0–34). Thus all glucose-tolerance curves were flattened.

Small-intestine radiography.—In normal adults contrast radiography with both flocculable and non-flocculating media, shows a fine feathery mucosal pattern. In adults with the sprue syndrome, simple flocculable suspensions of barium sulphate give a clumped or flocculated appearance which is evidence of an increase in mucus secretion (Frazer, French, and Thompson 1949). Examination of such cases with non-flocculating suspensions shows a wide dilated small-intestine pattern (Ardran, French, and Mucklow 1950).

In normal children simple suspensions give a feathery mucosal pattern less often than in adults, the barium often presenting a clumped appearance (Zwerling and Nelson 1943). A more feathery appearance is seen with the non-flocculating suspension (Astley and French 1951).

In the eight cœliac children examined with the simple suspension a flocculated appearance was invariably seen in the small intestine; the non-flocculating suspension showed a wide dilated appearance similar to that in the adult sprue syndrome, the feathery appearance of the mucosa being absent. These results are to be reported in detail elsewhere. The difference between the normal intestine and the dilated appearance observed in these cases is shown in figs. 1 and 2.

CONCLUSION

From these observations it would appear that the changes in gastro-intestinal function are identical with those of adult idiopathic steatorrhœa.

The Effect of Wheat Flour

METHOD

After completing these basic studies, we investigated the influence of wheat in two stages: (1) by placing the child on an entirely wheat-free diet (diet B); and (2) by the reintroduction of wheat flour, wheat starch, or wheat gluten into the diet. The effects were assessed by repeating the gastro-intestinal studies and by clinical observation of the remissions and exacerbations induced by changes in diet.

Diet containing Wheat Flour (Diet A)

Diet A was the normal hospital diet containing the usual starchy foods, and corresponded to a daily intake of 60–80 g. of wheat flour.

Diet free from Wheat Flour (Diet B)

Diet B was the normal hospital diet modified by the substitution of cornflour and/or soya flour, for wheat flour, the latter being entirely excluded.

Fat-content (40 or 50 g. daily depending on age) was controlled throughout in all the diets; carbohydrate and protein were approximately 150 g. and 45 g. daily respectively. The cornflour or soya flour was made into biscuits to replace bread. In young or very sick children a high calorie milk mixture, thickened with cornflour, was used instead of biscuits.

TABLE II—DIFFERENCE IN FÆCAL FAT ON DIET A AND DIET B

	Case no.	1	2	3	4	5	6	7	Mean
Fæcal fat (g. per day)	Diet A (normal)	15·2	12·0	10·4	8·0	20·0	10·0	6·4	11·7
	Diet B (wheat-free)	2·0	3·2	3·2	2·4	6·8	2·8	4·0	3·5

Figures in each case are the average of 10 consecutive days. Fat intake 40 g. per day (50 g. in cases 4 and 6).

Wheat Starch and Gluten Fractions

The wheat starch and gluten fractions were prepared for us by Energen Foods Co. from Canadian spring wheat. The flours were untreated and unbleached, and had no vitamin or calcium additions. A dough of normal consistence was made with water and 1·5% sodium chloride. The salt was included to facilitate the removal of soluble proteins. No yeast, raising ingredients, or other additives were included. After standing for half an hour, the dough was kneaded under water for an hour, while the starch was extracted in suspension. The water was replaced at intervals. The resulting gluten mass was dried in a high vacuum at a maximum temperature of 60°C. It was then broken down and ground to a 60 mesh. The final protein-content was 80%.

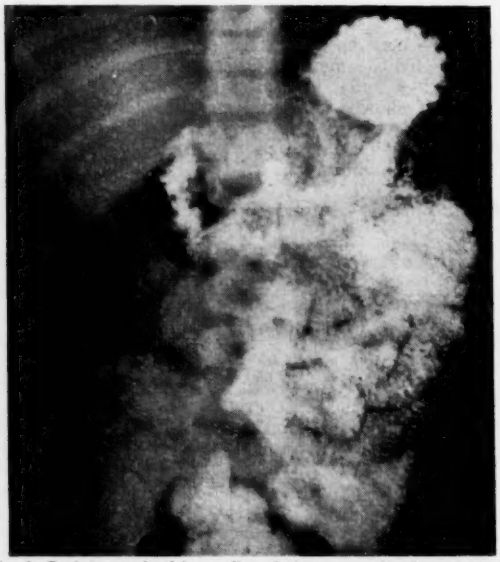

Fig. 1—Barium meal with non-flocculating suspension in a normal child.

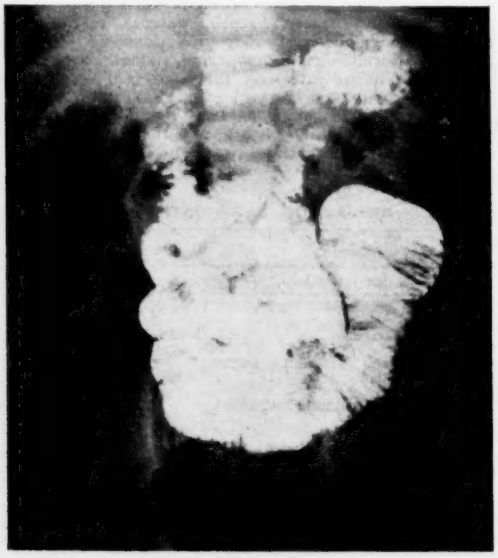

Fig. 2—Barium meal with non-flocculating suspension in a child with cœliac disease.

TABLE III—COMPARISON OF FINDINGS IN SEVEN CASES OF CŒLIAC DISEASE ON DIET A (WHEAT-FLOUR-CONTAINING) AND DIET B (WHEAT-FLOUR-FREE)

Case no.		1	2	3	4	5	6	7
Chylomicrograph ..	Diet A	flat	flat	sub-normal	flat	flat	flat	flat
	Diet B	normal	normal	normal	normal	improved	normal	normal
Oral glucose tolerance ..	Diet A	flat	flat	flat	flat	flat	flat	flat
	Diet B	normal	almost normal	normal	almost normal	improved	normal	improved
Small intestine radiography (non-flocculable suspension)	Diet A	dilated	dilated	dilated	dilated	dilated	dilated	dilated
	Diet B	normal	improved	improved	almost normal	dilated	normal	normal

RESULTS

Exclusion of Wheat Flour from the Diet

All the children improved clinically when placed on the wheat-free diet. In 2–3 weeks there was a marked change: they ate more, gained in weight, and lost their irritability; the diarrhœa diminished and in most cases the stools became darker and formed.

The seven children who had been maintained on a continuous fat-balance were reinvestigated.

Within 30–50 days fat-balances showed the disappearance of excessive fat from the stools. Table II shows that in six out of the seven children the fæcal fat returned to normal levels on diet B. The seventh case showed a marked improvement, but the fæcal fat level was still above normal.

Chylomicrographs, glucose tolerance, and small-intestine radiography showed commensurate improvement, though return to normal was not always as rapid as in the case of the fæcal fat (table III).

Reintroduction of Wheat Flour, Starch, or Gluten

Wheat flour.—After a period on the wheat-flour-free diet, during which the fæcal fat output fell to within normal limits and general recovery took place, reintroduction experiments were begun. It was found that the inclusion of 60–80 g. wheat flour per day resulted in rapid deterioration. Within 1–3 weeks there was a loss of appetite, sometimes associated with vomiting, diarrhœa returned, there was a change of temperament, and the children began to lose weight. The continuous fat-balances showed that the return of the diarrhœa was soon associated with excessive fæcal fat.

Two patients were treated in this way, and deterioration was induced on two occasions in each. In the second phase of deterioration, non-agenised flour was used. One case is reported in full below (case 1).

Wheat starch.—In view of the observations of Weijers and van de Kamer (1950) that wheat starch did not cause deterioration in cœliac disease, it was decided to study the effect of the starch fraction on children already ill on diet A. Two children were fed with 80 g. daily of pure wheat starch in the form of biscuits. All other forms of wheat were excluded from the diet. Improvement took place comparable with that obtained on diet B (case 1). This suggested that the factor causing deterioration was confined to the gluten fraction. Wheat starch was therefore included in the otherwise wheat-free diet, for it made the biscuits more palatable and of a better texture.

Wheat gluten.—A suspension of wheat gluten in water was given to three children already in remission on diet B. The quantity used was roughly equivalent to the amount of gluten present in the basic wheat-flour diet. Within 1–3 weeks, deterioration took place in exactly the same way as when wheat flour was given. The recrudescence of diarrhœa was again associated with an increase in fæcal fat, and chylomicrographs and small-intestine pattern also showed a reversal towards the initial state. When gluten was omitted, recovery again occurred. The results in these three cases are reported in detail below (cases 2, 3, and 4).

Controls.—Six normal children in the same age-group had a similar quantity of gluten added to their normal diet for 3 weeks, with no change in appetite, demeanour, or bowel habits. Fæcal fat output was measured in two cases, and showed no increase during the feeding of gluten.

CASE-RECORDS

Case 1.—A girl, aged 3, had been ill for 9 months with diarrhœa, intermittent vomiting, and progressive emaciation. She weighed 16 lb. (fig. 3*a*) and was unable to stand. The results of gastro-intestinal function tests on diet A are shown in table I.

She was placed on diet B and vomiting, diarrhœa, and anorexia disappeared within 2 weeks. The stools became formed and less frequent. She gained 10 lb. in 10 weeks. The daily fæcal fat, chylomicrograph, oral glucose tolerance, and X-ray appearances returned to normal.

The change in her appearance 9 months later is shown in fig. 3*b*.

After she had been on diet B for 3 months, wheat flour was again introduced into the diet. The 220-day fat-balance (fig. 4) shows the increase in fæcal fat which followed. Anorexia, vomiting, diarrhœa, and abdominal distension returned. When the wheat flour was replaced by wheat starch, which forms about 90% of the wheat flour, there was a gradual return to normal fæcal fat levels and a steady improvement in the child's condition, similar to that observed on diet B. Wheat flour was again added to the diet and an increase in

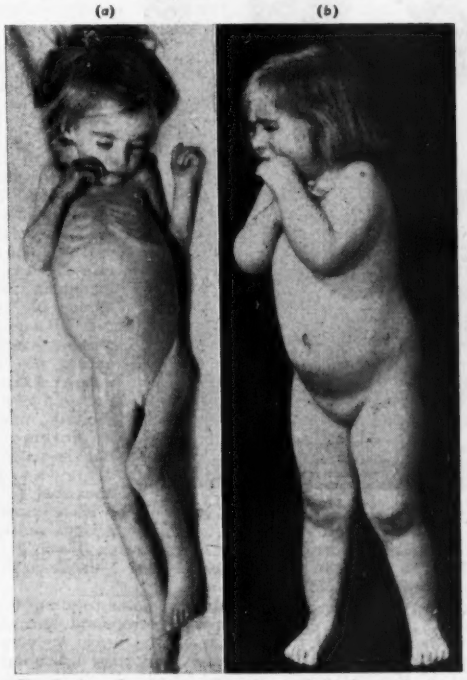

Fig. 3—Case 1: (*a*) on admission and (*b*) 9 months later.

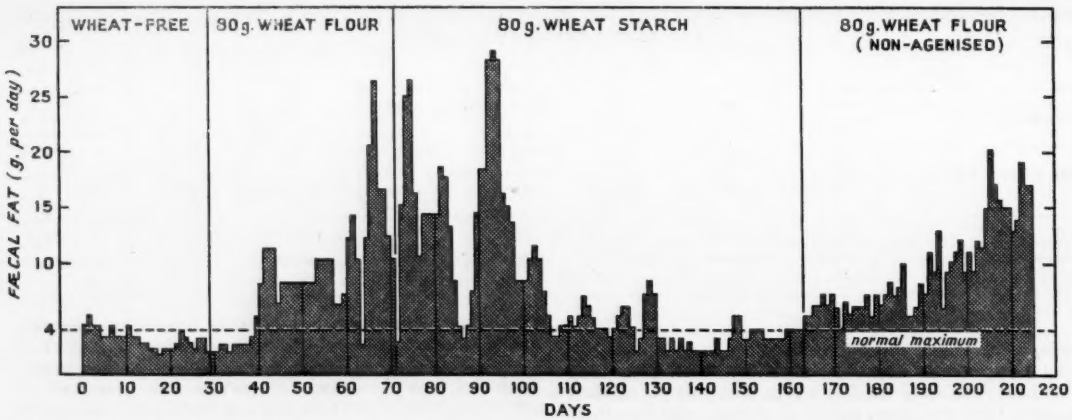

Fig. 4—Continuous fat-balance in case 1 on 40 g. of fat daily, showing rise in fæcal fat on introduction of wheat flour and fall to normal after substitution of wheat starch.

fæcal fat and general deterioration again occurred. On the second occasion the wheat flour used was non-agenised.

Case 2.—A girl, aged 3, had a history of diarrhœa, occasional vomiting, loss of weight, and increasing protuberance of the abdomen for 11 months. She weighed 25 lb. and had the classical appearances of cœliac disease (fig. 5*a*). Her gastro-intestinal function showed the usual changes (table I).

On diet B her appetite increased within a week and vomiting ceased. In the 2nd week diarrhœa ceased and the stools became darker; after 3 weeks she had only one stool a day, semi-formed, and normal in size and colour. The decrease of fæcal fat and increase of body-weight are shown in fig. 6. After 6 weeks on diet B the daily fæcal fat had fallen to 3·2 g., the chylomicrograph maximum increment had risen to 170 particles per field, and the oral glucose maximum increment was 39 mg. per 100 ml. Radiographic examination of her upper small intestine showed much improvement, but the pattern was still abnormal.

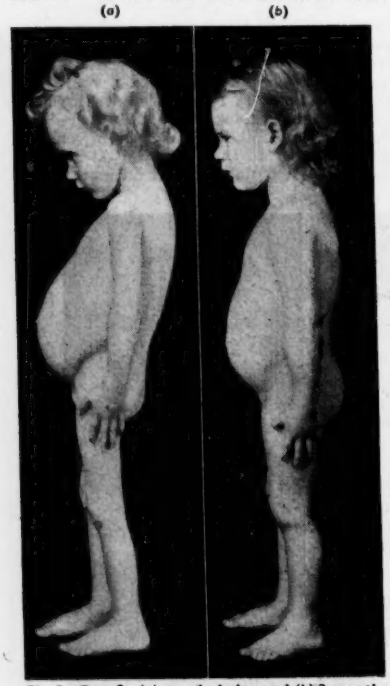

Fig. 5—Case 2: (a) on admission and (b) 3 months later after 7 weeks on wheat-free diet.

These investigations showed that she had almost returned to normal after 6 weeks on diet B. The change in her appearance after 7 weeks on this diet is shown in fig. 5*b*.

She was then given gluten in divided doses totalling 9 g. per day. Within 3 days her appetite decreased and she became more irritable. After a week she began to vomit occasionally, the stools became paler, and their fat-content increased. Within 2 weeks the fæcal fat was clearly abnormal (fig. 6), she had lost $1^1/_2$ lb. in weight, and the stools were now becoming loose and bulky. The gluten was withdrawn and the child's condition again improved.

Case 3.—A girl, aged $2^1/_4$, had passed offensive, bulky stools for 1 year. She was emaciated with a protuberant abdomen and unhappy disposition. She weighed 20 lb. (fig. 7*a*). Table I shows the results of gastro-intestinal investigation.

On diet B her appetite and temperament soon improved, and the fæcal fat decreased (fig. 8). Reinvestigation showed: daily fæcal fat 3·2 g., chylomicrograph maximum increment 300 particles per field, and oral glucose maximum increment 90 mg. per 100 ml. Radiography showed some improvement, but the intestinal pattern was still definitely abnormal.

Her appearance 6 months after admission is shown in fig. 7b.

Fig. 8 shows an increase of fæcal fat after the child had been on diet B for about 3 weeks. This was associated with a coryza and has been seen in other cœliac children on continuous fat-balances.

When 9 g. of wheat gluten was added to her daily diet, the fæcal fat began to increase (fig. 8), and anorexia, occasional vomiting, and loose stools returned. She began to lose weight. On withdrawing the gluten the child recovered.

Case 4.—A boy, aged 6, had been treated for 3 years on a low-fat diet, and was progressing moderately well. However,

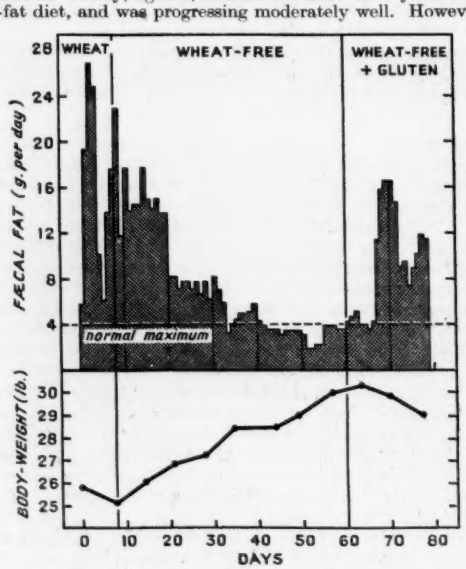

Fig. 6—Continuous fat-balance in case 2 on 40 g. of fat daily, showing fall in fæcal fat and rise in weight on wheat-free diet, followed by deterioration on gluten.

he still had two to three loose stools daily, he was rather undersized, and had a protuberant abdomen. The results of investigation on diet A are shown in table I.

On diet B the fæcal fat fell to normal within 2 weeks (fig. 9) and he had only one formed stool daily. In 5 weeks on diet B he gained $3^1/_2$ lb.; during the preceding 5 weeks he had gained only 1 lb. In the 4th week on diet B daily fæcal fat was 2·4 g., chylomicrograph maximum increment 250 particles per field, and oral glucose maximum increment 37 mg. per 100 ml. The radiographic appearance of the small intestine was much improved, but not quite normal.

He was then given 12 g. of gluten per day. After 3–4 days his appetite diminished, in a week he developed profuse, watery diarrhœa, and in 2 weeks fæcal fat had increased. A week later gluten was withdrawn and there was gradual improvement in appetite and diarrhœa (fig. 9).

Discussion

As children with cœliac disease apparently show the same radiological changes in the small intestine and the same biochemical abnormalities as adults with idiopathic steatorrhœa, it seems likely that they suffer from the same defect of absorption in the upper intestine, probably affecting all substances.

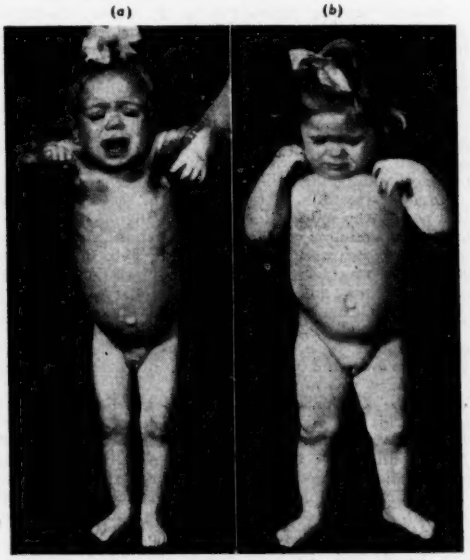

Fig. 7—Case 3 : (a) on admission and (b) 6 months later.

On the normal hospital diet there was a big increase in fæcal fat in all our cases, and although this may not be entirely of dietary origin, the evidence suggests that most of the fat came from the diet and that it indicated an absorption defect. It seems likely that fat is normally digested and prepared for absorption by fine emulsification, but that absorption of particulate fat is delayed and depressed, as shown by the chylomicrographs.

The glucose-tolerance curves are also compatible with an absorption defect for recent work has shown that the low curves in adult idiopathic steatorrhœa are associated with a defect in the absorption of all substances (Frazer, French, Thomas, and Thompson 1952). The absorption defect may possibly be due to excessive mucus secretion or lack of intestinal motility, as suggested by the radiological findings, or to both. Excessive bacterial activity in the upper small intestine may be related to these abnormalities.

The investigation of our patients showed that the striking clinical improvement on wheat-free diet was accompanied by parallel increase in the absorption of fat. This confirms the original observations of Dicke (1950) and the later studies of Weijers and van de Kamer (1950)

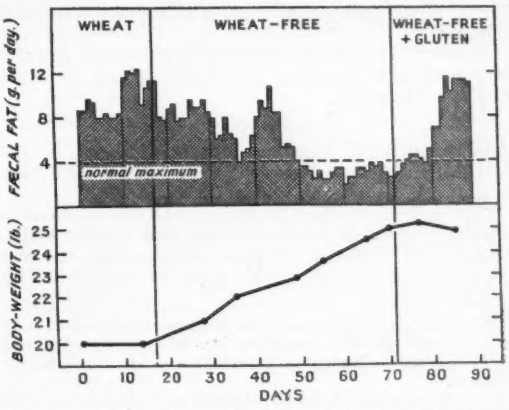

Fig. 8—Continuous fat-balance in case 3, on 40 g. of fat daily, showing fall in fæcal fat and rise in weight on wheat-free diet, followed by deterioration on gluten.

on the beneficial effect of excluding wheat and rye flour from the diet of cœliac children. The radiographic appearances of the small intestine and the absorption of glucose and particulate fat also became more normal, suggesting that all absorption had improved.

The effect of reintroducing wheat flour or wheat gluten makes it quite clear that wheat causes deterioration in cœliac children, but not in normal children. Agenisation of the wheat flour seems to play no part in this. Wheat starch does not have the same action as wheat flour, showing that it is not the starch itself which is harmful; in fact children on a relatively high total intake of starch improved rapidly. Many previous workers have reported that starches have a deleterious effect in cœliac disease, and claimed that their removal from the diet was essential to clinical improvement. In the diets recommended in these reports, however, the removal of starches was synonymous with the removal of wheat flour (Howland 1921, Sauer 1925, Haas 1938, Andersen 1947, Sheldon 1949, May and Lowe 1951). The improvement recorded in these reports, was not so much due to the strict removal of all starches as to the fact that their removal entailed the exclusion of wheat gluten.

Our present studies indicate that even in the early stages of treatment there is no need to restrict carbohydrate or even fat; an almost unlimited choice of food may be made provided that wheat and rye flour are excluded. A high caloric diet may be given throughout, with biscuits made from cornflour, soya flour, or wheat starch instead of bread. All the children sent home on this diet have so far remained in normal health. The

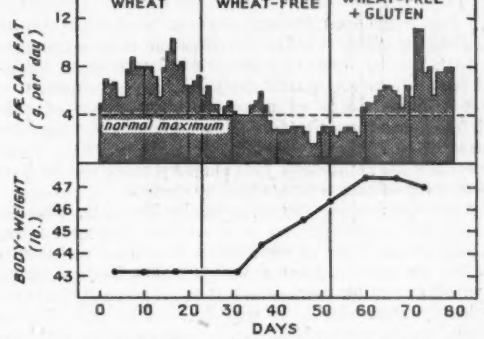

Fig. 9—Continuous fat-balance in case 4 on 50 g. of fat daily, showing fall in fæcal fat and rise in weight on wheat-free diet, followed by deterioration on gluten.

dietary control of cœliac disease has thus been much simplified.

The precise way in which the gluten fraction disturbs gastro-intestinal function in cœliac disease is being further investigated.

Summary

Gastro-intestinal function was investigated in ten children with cœliac disease. The changes were very similar to those in adult idiopathic steatorrhœa.

The removal of wheat flour from the diet resulted in rapid improvement, both clinically and biochemically. Deterioration followed the reintroduction into the diet of wheat flour or wheat gluten, but wheat starch had no harmful effect.

This work has been carried out in close collaboration with Prof. H. ten Bokkel Huinink, Dr. H. A. Weijers, and Dr. J. H. van de Kamer of Utrecht to whom we are much indebted.

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NEPHROSIS TREATED BY MALARIA

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IT has long been known that in nephrosis—type-II nephritis of Ellis (1942)—a remission may sometimes be initiated by one or other of a variety of agents such as infections, particularly measles, infusions of plasma, large doses of urea, or large doses of salts such as potassium citrate. More recently A.C.T.H. has been added to this list (Barnett et al. 1950, Riley 1950). Sometimes the remissions provoked by these means have proved long-lasting and amount to cures.

After experiencing the occasionally dramatic effect of measles on nephrosis, as well as the difficulties and dangers of this form of treatment, it seemed sensible to look for an acute infection which might have a therapeutic effect similar to measles but could be easily induced and easily controlled. It was decided to try whether malaria would fulfil this need. Four patients with the nephrotic syndrome have been infected with malaria to date, in two with dramatic effect, and in two with no such effect (one of the latter proved to have type-I nephritis).

CASE-RECORDS

Case 1.—A girl, aged 5 years, developed generalised œdema in January, 1948. There had been no preceding sore throat or other infection. During the next nine months, spent in various hospitals, she remained constantly œdematous.

On admission in September, 1948, she had generalised œdema with gross ascites; blood-pressure 135/85 mm. Hg, retinal vessels normal. Her urine contained albumin, a few red cells, and granular casts. The plasma-albumin level was 1·2 g. per 100 ml., plasma-globulin level 3·1 g. per 100 ml., plasma-cholesterol level 550 mg. per 100 ml., blood-urea level 26 mg. per 100 ml.

Progress.—During the next four months the patient's condition remained the same; on eight occasions ascitic fluid in amounts of about 3 litres was removed. On two occasions the skin of the legs was incised and about 7 litres of œdema fluid drained off. In addition the following treatments were successively applied, but without effect: (1) high-protein salt-free diet; (2) mercurial diuretic ('Novurit') 1 ml. intramuscularly on alternate days for five doses; and (3) urea 30 g. daily for seven days.

Malaria Therapy.—On Jan. 12, 1949, malarial mosquitoes were applied. These, as also in the subsequent cases, were *Anopheles atroparvus* infected with *P. vivax*, Madagascar strain. On Jan. 18 the patient still had generalised œdema with ascites; her blood-pressure was 120/75 mm. Hg; and her urine contained a moderate amount of albumin and occasional red cells, but no casts. Her plasma-albumin level was 1·0 g. per 100 ml., plasma-globulin level 2·6 g. per 100 ml., non-protein nitrogen level 28 mg. per 100 ml., and plasma-cholesterol level 750 mg. per 100 ml. On Jan. 24 malarial fever began, the temperature rising to 102°F. Next day diuresis set in and œdema began to subside rapidly, disappearing completely by Feb. 2, ten days from the onset of fever. In this period the patient lost 18 lb., bringing her weight to 42 lb. Her urine now contained less albumin, and the blood chemistry was returning to normal; on Feb. 9 the plasma-albumin level was 2·4 g. per 100 ml., plasma-globulin level 4·6 g. per 100 ml., and plasma-cholesterol level 200 mg. per 100 ml. The malarial fever was at first quotidian. On the third day 'Thio-bismol' 0·2 g. was injected intramuscularly to change the fever to a tertian rhythm (Whelen and Shute 1943). After eleven days' fever mepacrine was administered and the malaria was rapidly controlled.

Follow-up.—The patient has now been followed for three years since this remission. She has continued well and developed normally. A malarial relapse occurred six months after the original infection; this responded normally to mepacrine. At present she is in good health, with normal blood-pressure and blood chemistry (plasma-proteins, plasma-cholesterol, and blood-urea). Her urine contains a moderate amount of albumin, but no red cells or casts.

Case 2.—A boy, aged 12 years, developed generalised œdema in September, 1950. There had been no preceding sore throat or other infection. At the age of 5 years he had been thought to have a mild form of cœliac disease, but had thrived subsequently.

On examination two weeks after the onset of the œdema, this was found to be generalised, with severe ascites and bilateral hydrothorax. The boy's blood-pressure was 110/70 mm. Hg, and his retinal vessels were normal. His urine contained very much albumin, with a few red cells and hyaline and granular casts. His plasma-albumin level was 0·8 per 100 ml., plasma-globulin level 1·2 g. per 100 ml., plasma-cholesterol level 300 mg. per 100 ml., and blood-urea level 20 mg. per 100 ml.

Progress.—During the next five months the patient's condition remained the same, with minor fluctuations in the œdema; ascites was always prominent and required tapping on seven occasions, when fluid in amounts up to 6 litres was removed. The loss of protein in the urine averaged 10 g. daily. The following treatments were successively tried during this period: (1) dextran in saline solution, 1 litre infused intravenously; (2) mercurial diuretic (mersalyl) 0·5, 0·5, and 1·0 ml. intravenously at three-day intervals for three doses; (3) A.C.T.H. 80 mg. intramuscularly in divided doses daily for eleven days; and (4) large doses of citrate—sodium citrate 240 g., potassium citrate 60 g., citric acid 300 g.—for four days, followed by half these quantities for a further twenty-one days. On Nov. 9, 1950, the patient

contracted mild Sonne dysentery. None of these agents affected his illness, and on Feb. 20, 1951, he still had gross generalised œdema with ascites, and his urine contained large amounts of albumin with a few red cells and granular casts. His plasma-albumin level was 1·6 g. per 100 ml., plasma-globulin level 3·2 g. per 100 ml., plasma-cholesterol level 425 mg. per 100 ml., and blood-urea level 22 mg. per 100 ml. His blood-pressure was 120/80 mm. Hg.

Malarial Therapy.—On this day (Feb. 20) the patient was infected by malarial mosquitoes, and on March 5 he began to have pyrexia (105°F) with rigors. The fever tended to be quotidian, and on March 10 thio-bismol 0·2 g. was injected intramuscularly. Thereafter the fever was tertian, and pyrexia did not exceed 100°F until March 22, when higher temperatures recurred. On March 28 mepacrine was exhibited, and the malaria was rapidly controlled. Diuresis began on March 16, the twelfth day of the fever; within six days (March 22) 15 lb. had been lost, bringing the weight to 56½ lb. Œdema was then absent, and the albuminuria varied from nil to +++. The plasma-cholesterol level had fallen to normal (131 mg. per 100 ml.), but the plasma-albumin level was still low at 1·6 g. per 100 ml. A month later (April 23) the blood chemistry was entirely normal: albumin 3·6 g. per 100 ml., globulin 2·6 g. per 100 ml., non-protein nitrogen 20 mg. per 100 ml., and cholesterol 94 mg. per 100 ml.

Follow-up.—Twelve months after his remission the boy remains well. A suspected malarial relapse occurred six months after the original infection but was easily controlled by mepacrine. The urine, tested for albumin on many occasions, contains usually none, sometimes a trace; red cells and casts are absent. The blood-pressure has varied from 110/70 to 130/98 mm. Hg.

Case 3.—A boy, aged 5 years, developed generalised œdema in October, 1946. There had been no preceding sore throat or other infection. When first examined a month later (November, 1946), by Dr. L. C. Martin, he showed the typical nephrotic picture with gross œdema and ascites; normal blood-pressure; gross albuminuria without red cells or casts; plasma-albumin level low, plasma-cholesterol level high, and blood-urea level normal. He was followed for the next three and a half years, during which time his condition fluctuated, with some periods of complete freedom from œdema and albuminuria.

Malaria Therapy.—In June, 1949, when both the œdema and the albuminuria were gross, the patient was infected with malarial mosquitoes. For twelve days he had a tertian fever (temperature up to 105°F) with rigors, after which mepacrine was administered. The only effect on the nephrotic syndrome was that the plasma-cholesterol level, which over the preceding month had varied between 259 and 338 mg. per 100 ml., began to fall on the fifth day of fever, reaching a low level of 88 mg. per 100 ml. on the eleventh day, and remaining below 160 mg. per 100 ml. for a month, before rising to its original high level. The œdema and albuminuria were not certainly influenced.

Follow-up.—Subsequently this boy's œdema continued to fluctuate up till November, 1949, when he was last seen. At no time was there hypertension or nitrogen retention, and the urine, although usually containing much albumin, never contained more than a few red cells.

Case 4.—A boy, aged 5 years, developed generalised œdema in January, 1949. There had been no preceding sore throat or other infection.

On examination four months later he had gross œdema with ascites, blood-pressure 130/85 mm. Hg, and normal retinal vessels. His urine contained much albumin and numerous red cells and granular and hyaline casts. His plasma-albumin level was 1·4 g. per 100 ml., plasma-globulin level 2·9 g. per 100 ml., blood-urea level 50 mg. per 100 ml., and plasma-cholesterol level 400 mg. per 100 ml.

Progress.—His condition remained unaltered during the next month, during which the ascites required tapping on two occasions.

Malaria Therapy.—In April, 1949, he was infected with malaria, and for twelve days he had an irregular pyrexia (temperature up to 105°F) and rigors, after which mepacrine was given. As in case 3 the sole effect was a lowering of the plasma-cholesterol level: this had varied from 400 to 650 mg. per 100 ml. during the preceding month; on the day following the first rigor it was 262 mg. per 100 ml., and a week later 176 mg. per 100 ml.; during the next three weeks it returned to about 400 mg. per 100 ml. The blood-urea level remained raised at 50–96 mg. per 100 ml. Frequent tapping of the ascites continued to be needed, until death took place from bronchopneumonia in July, 1950.

At necropsy Dr. A. M. Barrett found the following renal histology:

Glomeruli: no gross reduction in number; considerable variation in appearance, many being almost normal; organised glomerular necroses and crescents; many capsular adhesions; hypertrophy of epithelial cells lining Bowman's capsule.

Tubules: evidence of much tubular destruction and regeneration; conspicuous patchy dilatation of tubules, which were filled with eosinophilic coagulum; no lipoid infiltration.

Interstitial fibrosis diffuse and severe.

These histological findings were considered to be those of a diffuse nephritis—probably type-I nephritis (Ellis 1942), although showing unusual features. Prof. Clifford Wilson, who kindly examined the sections, agreed with the diagnosis of type-I nephritis.

DISCUSSION

Cases 1, 2, and 3 showed the nephrotic syndrome in its "pure" form, with normal or nearly normal blood-pressure, no nitrogen retention, and only a few red cells or casts in the urine. In case 4 there was nitrogen retention, and red cells and granular casts were always numerous in the urine; the renal histology in this case showed the features of Ellis's (1942) type-I nephritis.

That the remissions shown by cases 1 and 2 were related to the malaria seems certain, since each patient had been previously followed for long periods—twelve months and five months respectively—without at any time having a remission. It is, however, noteworthy that diuresis started in case 1 within a day of the onset of malaria, and in case 2 diuresis started after fever had continued for twelve days.

Since the ætiology of nephrosis is entirely unknown, the mechanism by which remissions are initiated remains equally obscure. When it was found that A.C.T.H. could initiate remissions in a fair proportion of cases of nephrosis (Barnett et al. 1950, Riley 1950), it seemed likely that adrenal stimulation was the common action of the various agents known to produce occasional remissions, and the means by which they achieved their effect. The fact that in case 2 A.C.T.H. did not provoke a remission, although malaria subsequently did so, appears at first sight to argue against this surmise. Nevertheless, Rapoport et al. (1951), who found that A.C.T.H. induced a remission in a large proportion of 34 children with nephrosis, noted that, when a first course had not provoked a remission, a second course might yet sometimes do so.

The behaviour of the plasma-cholesterol is also of interest, since hypercholesterolæmia is a constant feature of the nephrotic syndrome, although its significance is obscure. In cases 3 and 4, although œdema was unaffected by malaria, malaria did cause a temporary fall of the plasma-cholesterol level to normal. Rapoport et al. also imply that some of their patients in whom A.C.T.H. had not influenced the œdema showed a temporary fall in the plasma-cholesterol level.

It thus remains possible that the effect of malaria in nephrosis is essentially the same as that of A.C.T.H. In any case, since nephrosis, in its earlier stages at least, may be reversible, it behoves the physician to try in turn the agents which are known to have initiated remissions. Malaria seems worth using in this manner, because it is simple to transmit and to control.

SUMMARY

Malaria induced in three children with nephrosis (type-II nephritis) produced a striking remission in two. These two children remain well three years and one year later. In the third child malaria produced no remission, but there was a temporary fall of the plasma-cholesterol level from high to normal level; this response was also

seen in a fourth child with a nephrotic syndrome due to a type-I nephritis.

Malarial mosquitoes were provided by the malaria reference laboratory, Horton Hospital, Epsom. I am most grateful to Sir Gordon Covell, director, and Mr. P. G. Shute, assistant director, for their collaboration.

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MALARIAL THERAPY IN LIPOID NEPHROSIS

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IN lipoid nephrosis the response to routine methods of treatment has always been disappointing. Dietary modifications, with salt restriction and increased protein intake, do not produce spectacular results; and the benefit often noted from the use of diuretics is almost always followed by recurrence of the pre-existing œdema.

The effect of adrenocorticotropic hormone has likewise been disappointing. Riley (1951) reports that in 9 out of 14 cases treated with A.C.T.H. diuresis was produced, but in only 5 did this diuresis lead to complete clearance of their œdema, and 4 of these relapsed shortly afterwards. In only 1 of the relapsed cases did a further course of A.C.T.H. have any beneficial effect.

In the past it has been noted that some nephrosis patients have had a considerable diuresis, followed by a long remission or permanent cure, immediately after recovery from an acute febrile infection. Applying Hans Selye's concept, I felt that this effect might be due to stimulation of the active defence phase of the adaptation syndrome. If this was so, it seemed that the artificial induction of some non-hazardous disease which could be readily controlled might lead to remission or even cure. I therefore decided to use malaria in a case of lipoid nephrosis which had not responded to other treatment, and was gradually becoming completely waterlogged. Malarial therapy has been used in this case on two occasions separated by an interval of two years, and in both instances the results have been rapid and spectacular.

CASE-RECORD

A boy, aged 2 years and 2 months, was admitted to hospital on July 1, 1949, with a history of an acute onset of scrotal œdema three days previously, followed by enlargement of the abdomen and, within forty-eight hours, massive albuminuria. He had œdema of the legs and scrotum, a large collection of ascitic fluid in his abdomen, and puffiness of his face. His urine was sterile and contained a very heavy deposit of albumin; no pus, blood, or casts were found. The blood-urea was 28 mg., the blood-cholesterol 380 mg., and the serum-protein level 3·5 g., per 100 ml.

Treatment and Progress.—He was given a high-protein salt-free diet, and various forms of treatment were adopted during the next few weeks to evoke effective diuresis. He did not respond to 'Diuretin,' a 500 ml. transfusion of plasma had no obvious effect, and, though there was a good initial response to mersalyl, the œdema quickly recurred. During this time a brief pyrexia was produced on one occasion by an injection of T.A.B. vaccine 0·25 ml. but did not provoke diuresis. At the end of five weeks the œdema had greatly increased, and the boy was becoming waterlogged.

Induction of Malaria.—On Aug. 4, 1949, 5 ml. of malarial blood was injected intramuscularly, and on Aug. 15, the malarial attack began with a mild rigor (104°F). The temperature curve thereafter was of classical periodicity. The boy was allowed six pyrexial peaks (only one further mild rigor occurred), and on Aug. 25, to end the attack, a combined course was started of proguanil 50 mg. t.i.d. for twelve days, and mepacrine 50 mg. t.i.d. for the first forty-eight hours, and thereafter once daily for the next three weeks.

Remission.—Diuresis began two days after the end of the attack of malaria and was copious for the next six days, at the end of which the boy was free from œdema. His weight, which before the onset of diuresis had been 37 lb., was now 30 lb.; his serum-protein level rose during the next ten days to 5 g. per 100 ml., and blood-cholesterol level fell to 271 mg. His urine still showed a cloud of albumin. On Sept. 8, 1949, he was discharged from hospital, and thereafter he attended the outpatients department at three-month intervals until he relapsed almost exactly two years later—on July 6, 1951—when he was readmitted to hospital. During this two-year interval his urine always showed a cloud of albumin, but he remained almost free from œdema, except once or twice when, after coryza, his face was "puffed up" for about a week. No definite cause could be found for the recurrence of his generalised œdema, which was as rapid in its onset on the second occasion as it had been in the previous attack.

On readmission his blood-urea was 30 mg., the serum-proteins 3·8 g., and the blood-cholesterol 583 mg., per 100 ml. His urine contained a very heavy deposit of albumin but was free from pus, blood, and casts.

Treatment with Dextran.—On July 9 and 16, 1951, dextran 500 ml. was given intravenously. It did not produce any diuresis, and the boy became waterlogged (fig. 1).

Induction of Malaria.—He was then inoculated with malaria, and his pyrexia began on Aug. 3, 1951. The temperature pattern in this attack was not quite classical, and the infection did not seem to be heavy, parasites being scanty in the blood films; but a satisfactory pyrexia was maintained for nine days, when the attack was terminated as before with a combined course of proguanil and mepacrine. Seven days after the end of the attack a profuse diuresis took place, and within five days he was free from œdema. His weight had fallen from 53 to 43 lb., and his blood-cholesterol was now 390 mg. per 100 ml., with blood-urea 22 mg.

Follow-up.—He was discharged from hospital on Sept. 8, 1951, and has since attended the outpatients department monthly. The slight albuminuria present on discharge from hospital has now disappeared, and he has been free from œdema (fig. 2). On Jan. 11, 1952, his blood-urea was 30 mg. per 100 ml. and his blood-cholesterol 281 mg. His urine was free from albumin and a urea-clearance test showed 165% average normal function.

The disappearance of protein from the urine and a highly satisfactory renal function test suggest that the present remission may prove to be permanent.

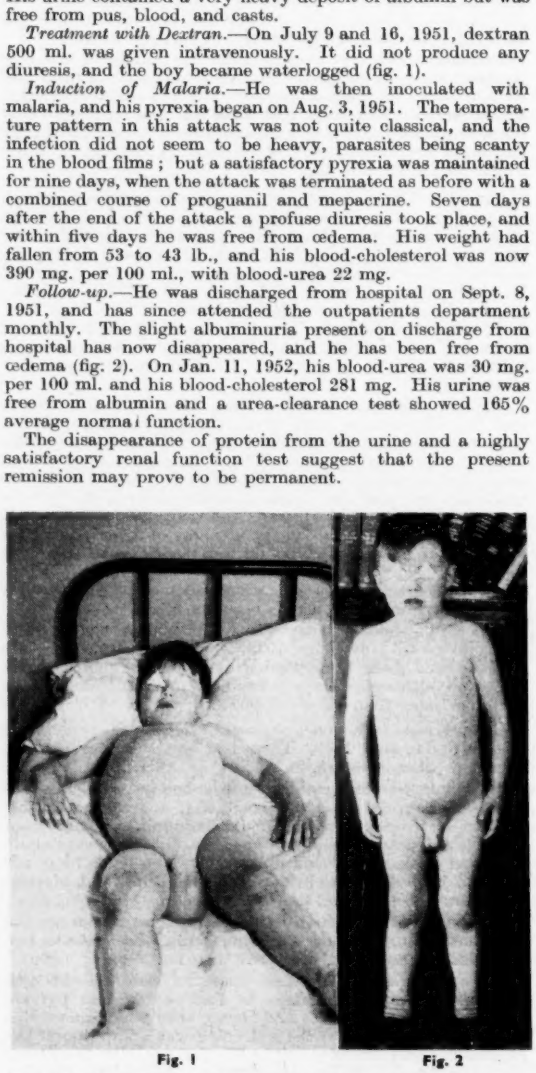

Fig. 1 Fig. 2

Fig. 1—Lipoid nephrosis before second induction of malaria.
Fig. 2—Same patient as in fig. 1 after malaria therapy of lipoid nephrosis.

DISCUSSION

Lipoid nephrosis falls naturally into the category of Selye's diseases of adaptation. It is capable of spontaneous and permanent remission; it responds, even though transiently, to A.C.T.H.; and remission or recovery has often followed an acute febrile infection.

The disease is a general one, and affects tissues other than the kidney. It is of particular interest that the œdema has been observed to precede the albuminuria by several days (Marriott 1949). The renal disorder itself is functional and selective; it is accompanied by a disturbance of cholesterol metabolism and by widespread disturbance of electrolyte concentrations in the blood and tissues (Fox and Slobody 1951).

In the nervous control of the adaptation syndrome the hypothalamus is the principal seat of coördination of the general defence mechanisms. It stimulates to activity both the nervous system and the anterior lobe of the pituitary gland, and is itself influenced, as regards the extent of its activity, by the prefrontal regions. The prefrontal area and the hypothalamus together may be regarded as an interdependent and "resonating" mechanism, and in the chain of events which constitute the general adaptation syndrome any disorder of function occurring in this system might well distort its basic pattern, particularly in its early stages when changes in electrolyte concentrations are taking place. Recent work suggests that the frontal lobes contain a mechanism involved in the regulation of electrolyte concentrations in the body-fluids; and considerable disturbance of renal function, and changes in the normal electrolyte pattern in the blood, follow stimulation of, or injury to, the posterior portions of the orbital areas (Cort 1948, McLardy 1950, Sweet et al. 1948). The transient response to A.C.T.H. compared with the prolonged and commonly permanent remissions following varying types of infection, suggests that it requires the production of the whole chain of events which makes up the general adaptation syndrome to effect a successful prolonged or permanent response.

It is not surprising that a disorder like lipoid nephrosis should predominate in infancy and early childhood, when full functional maturity of the resonating mechanism mentioned above has not yet been achieved. The disturbance of cholesterol metabolism is not easy to explain, for detailed knowledge of the mechanism through which this function is mediated is still very scanty. A similar type of disorder has been found after experimental injury to hypothalamic structures (Gildea and Man 1940); but it is not yet possible to advance any acceptable theory about the reason for its occurrence in the course of lipoid nephrosis.

In brief, lipoid nephrosis in infancy and early childhood seems to be brought about by a functional disturbance occurring, in certain susceptible persons, in the course of responses of the central nervous system to some types of stress which cannot be clearly identified but probably vary from case to case.

CONCLUSION

A case is described in which malarial therapy apparently cured lipoid nephrosis in a boy aged 5 years.

The nature of the syndrome is discussed, and an explanation of its causation is put forward.

It is suggested that malarial therapy may prove of value in other diseases of adaptation which occur during infancy and childhood.

I am indebted to Mr. P. G. Shute, of the Malaria Reference Laboratory, Horton Hospital, Epsom, for the infected mosquitoes. The species of parasite was *Plasmodium vivax* (benign tertian), Madagascar strain, and it was transmitted by *Anopheles atroparvus*.

References at foot of next column

MANAGEMENT OF RESPIRATORY INFECTIONS IN PATIENTS SEVERELY PARALYSED BY POLIOMYELITIS

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PATIENTS with a severe degree of residual paralysis of the respiratory muscles after anterior poliomyelitis present a considerable problem during the winter months. This applies particularly to those with a vital capacity of less than 1000 c.cm. The most minor infection of the upper respiratory tract may in a short time involve the bronchi, and, because the patients cannot cough up the mucous secretions, segmental, lobar, or whole-lung collapse may follow.

The problem is a comparatively simple one: to tide the patient over the period of infection and during that time to keep the bronchial tree as free as possible of the mucus which tends to accumulate there.

A sore throat or cold may in these patients, after 2 or 3 days of minimal symptoms, suddenly produce a gross catarrhal bronchitis. If it is left until this stage the physician may be called upon to deal with a sudden bronchial blockage. In these circumstances it has been the practice at the Royal National Orthopædic Hospital, Stanmore, to ask the physiotherapists to try to clear the bronchial obstruction and re-expand the collapsed area of lung. Frequently this has been impossible, and bronchoscopy has been necessary. Bronchoscopy in any patient is unpleasant and for these particular patients thereafter every cold is a terrifying experience.

The physiotherapists were handicapped by having no means of knowing just what was happening in the patient's chest. Moreover, on finishing a treatment they could not know whether their efforts had been useful or not. The method of clapping the uppermost side of the chest with the cupped hand as a means of dislodging mucus rapidly became painful to these thin patients and this made it difficult to continue treatment for as long as was necessary. A new routine was therefore devised, and this has been in use for the last two winters.

ROUTINE

(1) All severely paralysed cases have a radiograph of the chest taken on admission, with the inspiratory and expiratory positions on the same film. The diaphragmatic movements are therefore known. The vital capacity is also determined with a gasometer-spirometer and this measurement is repeated about every 6 weeks.

(2) All cases of even the slightest throat or nose infection in patients with residual paralysis of the chest are notified to the physician immediately they occur.

(3) Chemotherapy is immediately started—e.g., 'Estopen' 500,000 units 8-hourly.

(4) Cultures from the throat and/or nose are taken to determine sensitivity of organisms, so that, within 48 hours, alternative chemotherapy may be given if necessary.

(5) The physiotherapists have been taught how to examine the chest by inspection, by estimation of

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expansion of both sides with the hands, by percussion, and by auscultation. They are able to find out for themselves whether they are dealing simply with a sticky chest in which air entry and movement is equal on the two sides, or whether there is any area of the chest more particularly full of mucus than any other, or finally, and most important, whether there is any particular area of the chest in which movement or air entry are deficient. This instruction of the physiotherapist and the constant coöperation between her and the physician is of the utmost importance. Really effective physiotherapy cannot be maintained for these patients unless the physiotherapist knows what she is trying to do, and also, when she leaves the bedside, knows whether she has done it. The girls working in the department are taught how to recognise the existence of accumulations of mucus in the tubes, consolidation, bronchial obstruction, and pulmonary collapse. They are also taught the anatomical arrangement of the main bronchi so that if, for example, a right lower lobe has collapsed, they know the best posture in which to place the patient during their efforts to clear the affected area.

(6) The patients, if old enough, are told of the dangers of respiratory infection. It is made clear to them that they should complain at once if they feel a cold or a sore throat coming on, or if they suddenly have increased difficulty in breathing. This understanding of the situation by the patients and their coöperation are important. Preventive measures can be taken at the first opportunity and the patients themselves feel that the situation is under control; their anxiety is lessened and their confidence in those treating them is increased.

MANAGEMENT OF CATARRHAL BRONCHITIS

There are three stages in this emergency: (1) excess mucus generally in the bronchial tree; (2) blockage of a bronchus by mucus; and (3) collapse of lung beyond a blockage. Most of the patients are in stage 1. Some will progress to stage 2. It is looked upon as a failure if any reach stage 3.

During such an infection it may have to be accepted that a particular patient's bronchi will be more or less clogged with mucus for anything from 7 to 20 days. During this time it is the duty of the physiotherapist to attend to the patient four or more times a day to keep the bronchi reasonably free. There is one quite obvious method of doing this—coughing. As the patient cannot do this adequately for himself, the ideal treatment is to produce a reasonable cough for him. But since such treatment may have to continue for 2 or 3 weeks, it must not produce soreness of the chest wall. The most effective and least trying method of producing a cough is simply for the physiotherapist to place one hand on the front of the chest and one on the back and to press the two together in unison with the patient's feeble cough. The patient lies on one side with the uppermost knee flexed to prevent rolling into the prone position. The physiotherapist stands behind the patient with one hand on the front of the chest and the other on the back. The hand in front presses backwards and slightly downwards. The hand behind simply exerts counter-pressure (see figure). Mucus can be coughed up in this way by patients with vital capacities as low as 300 c.cm. Gravity will also help; but we are dealing with sticky mucus and it is no good expecting gravity and assisted coughing to clear a particular set of bronchial tubes in a minute or two.

The technique of clapping with the cupped hands and vibrations, which has been found valuable in cases with postoperative pulmonary collapse, has for two reasons been found unsuitable in paralysed patients. Firstly, the ordinary patient can be made to cough by these methods whereas the paralysed patient has to be helped to produce the cough, which his weak chest muscles cannot do for him. Secondly, the method rapidly becomes too painful to be borne.

Physiotherapist assisting patient to cough.

Generally Sticky Chest.—In clearing the lung as much as possible, the physiotherapist starts with the most vulnerable part—i.e., the lower lobes. The patient is placed on one side with the foot of the bed blocked to 20°. A greater tilt produces uncomfortable congestion of the face and the weight of the abdominal viscera against a weak diaphragm may further decrease the vital capacity. Four or five assisted coughs are followed by a pause of 10–20 seconds and then four or five more coughs. This sequence is continued for some 10–15 *minutes*. After it has been ascertained with the stethoscope that the first side is reasonably clear of rhonchi, the patient is turned on the other side and the procedure repeated. If necessary the patient can then be placed in the semi-supine position. The physiotherapist places one hand over the scapula behind and the other over the upper zone on one side in front. Coughing is assisted until first one upper lobe and then the other are reasonably clear. This procedure is repeated three or four times a day.

There is one addition to this routine which has been found of value. Mucus collects most dangerously during the night. The patient will probably wake up in the ward about 6 A.M. and the physiotherapist will not come on duty until after 9 A.M. It is both dangerous and unnecessary to leave the patient with a very sticky chest for those 3 hours. All that is needed is to block the bed to 20° and place the patient prone and head down with a Bragg-Paul respirator round the chest. He can then cough in bouts in unison with the expansions of the pneumatic jacket. In 20–30 min. a patient with a sticky chest will often have coughed up a large quantity of mucus and the chest be reasonably clear.

Bronchial Blockage.—Most patients will know when a sudden bronchial blockage has occurred. They are aware of increased difficulty in breathing. The area involved will move poorly, breath sounds will be absent, but it will still be resonant. It is the air in the lung beyond the block which enables assisted coughing at this stage to dislodge the mucus so much more easily. The patient is laid in a position with the blocked bronchus uppermost, and the treatment started. In a short time it may be found that the block has been cleared and air entry restored. But it does depend upon dealing with the emergency as quickly as possible.

A girl, aged 18, suddenly became conscious of increased difficulty in breathing. She was seen within 20 min. and it was found that though the right chest was resonant, there were no inspiratory breath sounds. Assisted coughing while lying on her left side cleared the block in less than 2 min. and breath sounds were again heard normally.

Pulmonary Collapse.—When the air beyond the block has been absorbed, there will be dullness, poor movement, and either no air entry or distant bronchial breathing. Assisted coughing may again clear the blockage and avoid bronchoscopy.

A small boy (not a poliomyelitis patient) had a generalised postoperative bronchitis with complete collapse of the middle lobe. A further X-ray film, taken after 10 min. of assisted coughing, showed that the lobe had half re-expanded. Hourly treatments followed. Next morning the middle lobe was almost normal and full re-expansion was obtained. Pulmonary collapse in poliomyelitis cases has been treated with similar success.

Finally, if segmental, lobar, or complete pulmonary collapse has occurred and physiotherapy has failed, bronchoscopy must be performed. We are fortunate to have the coöperation of Mr. A. M. Zamora, the ear, nose, and throat surgeon to the hospital. He has bronchoscoped such patients for us under local or, in younger patients, general anæsthesia. The general anæsthetic is usually thiopentone sodium, but it is sometimes necessary to keep a Bragg-Paul respirator running and to pass oxygen down the side tube of the bronchoscope. Mr. Zamora uses fine catheters attached to the electric suction apparatus to clear the bronchi, and he has usually obtained re-expansion. I am sure, however, that he will not mind my saying that we now think that we have failed if we have to ask for his help.

The same routine can usually be followed in iron-lung patients by sliding the tray of the tank out and tilting downwards. If necessary oxygen can be given by nasal catheters during treatment. Treatment in the tank is not at all easy. Some patients who are just able to breathe when out of the tank if they are well, may of course need to return to respirator life when their vital capacity is reduced by the infection.

I must acknowledge the help that the scheme has received from the staff of the physiotherapy department at Stanmore. Its success would have been impossible without their enthusiastic coöperation.

CORTISONE AND A.C.T.H. IN EXOPHTHALMIC OPHTHALMOPLEGIA

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EXOPHTHALMIC ophthalmoplegia is a relatively rare condition in which increase in bulk of the orbital contents leads to their protrusion and is associated with disorder of function of some or all of the extrinsic ocular muscles. Its causation is complex and ill understood, obscurity persisting despite much experiment.

The classical signs of thyrotoxicosis include lid retraction, which results in widening of the palpebral aperture and explains the staring look of the thyrotoxic. In such patients an abnormal extent of the globe's surface is exposed, and the illusion of proptosis is created where, in general, none exists. As Ida Mann (1946) points out, such an effect can be produced in many animals by agents which stimulate smooth muscle.

Marine et al. (1933) showed that exophthalmos so produced was presumably accomplished through a nervous mechanism, since it could be abolished by removal of the superior cervical ganglion, and it seems possible that the sympathetic stimulants which produce this effect act more readily in the presence of excess thyroxine.

Mulvany (1944) attributed the exophthalmos of thyrotoxic patients to a spastic contraction of the orbital smooth muscle secondary to increased sympathetic stimulation.

Pochin (1939) observed the effects of electrical stimulation of the cervical sympathetic in three patients during the operation of cervical sympathectomy. Retraction of the upper and lower lids and pupillary dilatation developed, but in no case did exophthalmos result.

That exophthalmos in man is not to be explained on the basis of increased sympathetic activity has been shown by Russell Brain (1939), who reported its development in a patient with paralysis of the cervical sympathetic from an existing syringomyelia.

The experimental production of exophthalmos has been largely concerned with the use of extracts of the anterior pituitary gland.

Marine and Rosen (1933) and Smelser (1936) produced exophthalmos in guineapigs by injecting extracts of the anterior lobe of the ox pituitary; these results were even more readily obtained when thyroidectomy had been performed before the injections. Smelser (1939, 1943) further demonstrated that such injections in thyroidectomised guineapigs caused exophthalmos and swelling of the orbital fat, which was almost entirely the result of an increase in the water content of this tissue. He showed that this process of connective-tissue hyperplasia and œdema was not confined to the orbital fat but also involved other body fats, though to a lesser extent. The extrinsic ocular muscles share in this pathological change, and Mulvany (1944) ascribes the ophthalmoplegia to a myopathic condition dependent on œdema, round-cell infiltration, and fibrosis.

The substance in anterior-pituitary extract responsible for these effects has not been definitely identified, but most published observations accept a close relation between the exophthalmic principle and the thyroid-stimulating hormone of the anterior pituitary (T.S.H.). Dobyns (1946) gave injections of anterior-pituitary extract containing a fairly high amount of thyrotropic hormone to guineapigs and demonstrated a correlation between the production of exophthalmos and mobilisation of fat from the depots associated with fatty changes in the tissues. However, the work of Jefferies (1949) suggested that experimentally induced exophthalmos cannot be attributed to thyrotropic activity alone, nor to pituitary-induced mobilisation of fat, and in the human disease Falconer and Alexander (1951) were unable to show a constant relation between the development of exophthalmos and the levels of circulating T.S.H.

Inhibition of T.S.H. secretion and thyroid function has been known to follow a continued dose of cortisone or of adrenocorticotropic hormone (A.C.T.H.) and is probably mediated through the pituitary, since it can be overcome by the giving of thyrotropic hormone (Hill et al. 1950). On these grounds it seemed that a trial of cortisone and A.C.T.H. in exophthalmic ophthalmoplegia would be justified. This present report is concerned with the effect of these drugs in five patients with this condition. We have previously had experience of the known ability of these substances to promote saline diuresis in certain œdematous states, and bearing in mind the belief that œdema of the orbital tissues plays a part, at least, in the production of exophthalmos we decided to investigate the sodium balance of these patients undergoing this form of treatment.

PROCEDURE

All the patients, except case 1, were given a diet providing a calculated daily sodium intake of 800 mg., together with a constant fluid intake. The urine was collected in 24-hour samples, and the sodium content was estimated. Measurements of proptosis were undertaken weekly with the Hertel exophthalmometer, the same person being responsible for all readings. The normal reading was taken as 17 mm. on the scale, and the results were expressed as millimetres of protrusion beyond this base-line. The clinical appraisal of thyroid function was supplemented by routine tests of basal metabolic rate (B.M.R.) and blood-cholesterol levels. Of the five patients three were male and two female (which emphasises the difference in sex-incidence compared with thyrotoxicosis). The youngest was aged 49 and the eldest 79.

CASE-RECORDS

Case 1.—A male postal inspector, aged 55, had proptosis and diplopia which had antedated by a few months the clinical recognition of thyrotoxicosis in 1945. The thyrotoxicosis had been controlled with thiouracil, but proptosis had gradually increased, with ocular paralysis and diplopia

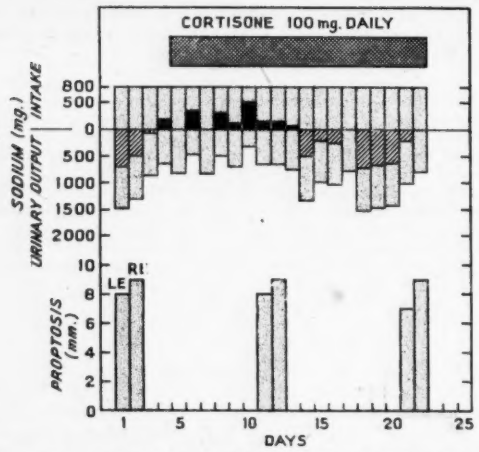

Fig. 1—Sodium balance in case 2: black areas, positive sodium balance; hatched areas, negative sodium balance; proptosis is expressed as mm. of protrusion beyond base-line of 17 mm. on Hertel exophthalmometer scale.

prominent in all directions of gaze. Thiouracil was discontinued in 1948, and he then remained well but without further change in the eye signs until May, 1951, when a further phase of thyrotoxic activity developed.

On admission to hospital in June, 1951, he was severely thyrotoxic (B.M.R. + 54%) and had the eye signs of exophthalmic ophthalmoplegia. There was 10 mm. of proptosis in the left eye and 6 mm. in the right, associated with paralysis of the external recti, superior recti, and inferior oblique muscles of both eyes.

Treatment.—Thiouracil therapy was recommenced, but after 3 weeks' treatment, and with the patient still obviously thyrotoxic, agranulocytosis supervened, and thiouracil was discontinued. At this time the white-cell count had fallen to 1200 per c.mm. (polymorphs 4%) the sternal marrow showing marked hypoplasia of both the erythroid and myeloid elements. Treatment with penicillin 250,000 units 6-hourly and A.C.T.H. 25 mg. 6-hourly was instituted, and there followed a rapid improvement in the clinical and hæmatological picture. A.C.T.H. was continued for 15 days, and coincidentally with its administration a notable lessening of proptosis was observed and confirmed by measurement.

Progress.—2 weeks after treatment the estimations showed only 5 mm. of protrusion in both eyes. The range of ocular movement increased, particularly as regards the external recti and inferior oblique muscles. The thyrotoxic element was also rapidly controlled, and the normal thyroid status following A.C.T.H. therapy was in notable contrast with the conspicuous, almost florid, thyrotoxicosis before treatment. The B.M.R. 2 weeks after A.C.T.H. had been discontinued was +9%, when he was discharged home.

Follow-up.—This patient's progress has been followed for 3 months. He has maintained his improvement and is well and back at work. There is no evidence of thyrotoxicosis clinically, and there has been no increase in exophthalmos.

In this case both the proptosis and ophthalmoplegia were favourably influenced by a 15-day course of A.C.T.H. Coexisting thyrotoxicosis was effectively and rapidly controlled. Sodium-balance estimations were not made.

Case 2.—A man, aged 49, developed thyrotoxicosis in 1945, when his eyes became prominent. After thyroidectomy proptosis increased and a mild subthyroid state required thyroid therapy.

On admission in August, 1951, he presented the eye signs of exophthalmic ophthalmoplegia. There was 8 mm. of proptosis in the left eye and 9 mm. in the right, with weakness of the external recti most marked in the right eye. Convergence was poor. There was no evidence of myxœdema clinically, and his general condition was good. Psychologically his mood was one of mild depression; he remained socially withdrawn and completely lacking in spontaneity. The B.M.R. was −12% and the blood-cholesterol level 270 mg. per 100 ml.

Treatment.—Thyroid medication was discontinued on admission. Dietary regulation of sodium and fluid intake was undertaken, and after a preliminary control period cortisone therapy was begun at a dosage of 100 mg. daily and continued for 17 days.

Progress.—No significant change in the exophthalmos was observed, but convergence improved. The urinary excretion of sodium was somewhat variable, showing a tendency to a negative balance during the latter half of therapy (fig. 1). No change was noted clinically in thyroid status, though the B.M.R. fell to − 26%. The blood-cholesterol level fell slightly to 240 mg. per 100 ml. after treatment.

This patient with post-thyroidectomy myxœdema and exophthalmic ophthalmoplegia did not respond to a 17-day course of cortisone. We hope to use A.C.T.H. later.

Case 3.—A housewife, aged 63, had developed proptosis and diplopia in 1944. A course of stilbœstrol had no effect on the eyes and was discontinued after 3 months, because of uterine bleeding. By the next year thyrotoxicosis was evident clinically, and treatment with thiouracil was begun. Control of the thyrotoxicosis was never entirely satisfactory, being attended by frequent drug reactions; and, after a thyroid crisis had been successfully treated in 1949, the patient underwent thyroidectomy. There was a postoperative increase in the proptosis, the eyes feeling uncomfortably full, with both horizontal and vertical diplopia. The subsequent development of myxœdema necessitated thyroid medication.

On admission the patient was a plump pleasant woman, still evidently slightly hypothyroid, judged by her facies, skin, and hair. Her B.M.R. was −2% and blood-cholesterol level 150 mg. per 100 ml. There was 7 mm. of proptosis in the left eye and 8 mm. in the right, with bulging of the supratarsal parts of both upper lids and fullness of the lower lids. Upward movement was defective in both eyes, weakness of the left superior rectus being most evident. Lateral movement was less severely restricted.

Treatment.—The usual dietary régime was adopted, and after a preliminary control period cortisone therapy was commenced at a dosage of 100 mg. a day and continued for 24 days. Thyroid extract was stopped on admission.

Progress.—Regression of proptosis and improvement in ocular muscle weakness were greatest at the end of the 3rd week of treatment, and were associated with gradual but increasing hypothyroidism, the patient complaining of the cold in somewhat huskier tones. The B.M.R. on cessation of cortisone was −28% and blood-cholesterol level 180 mg. per 100 ml., when thyroid therapy was started again. After

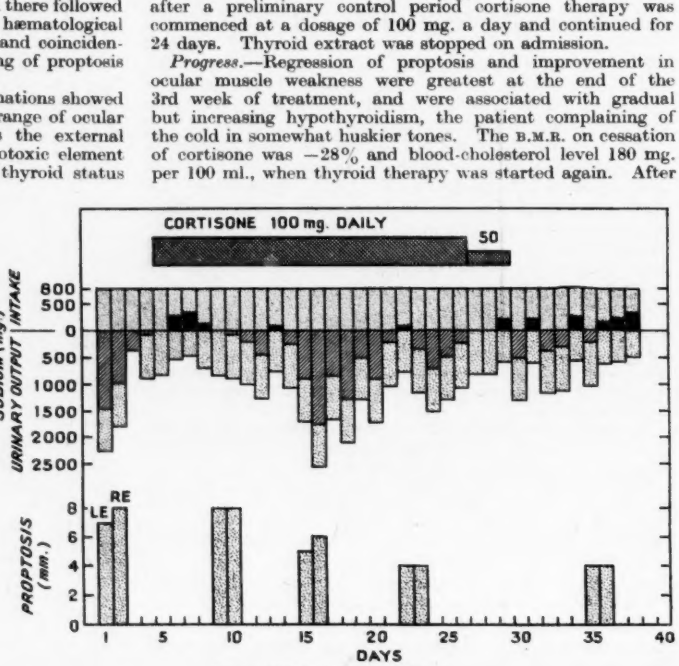

Fig. 2—Sodium balance in case 3.

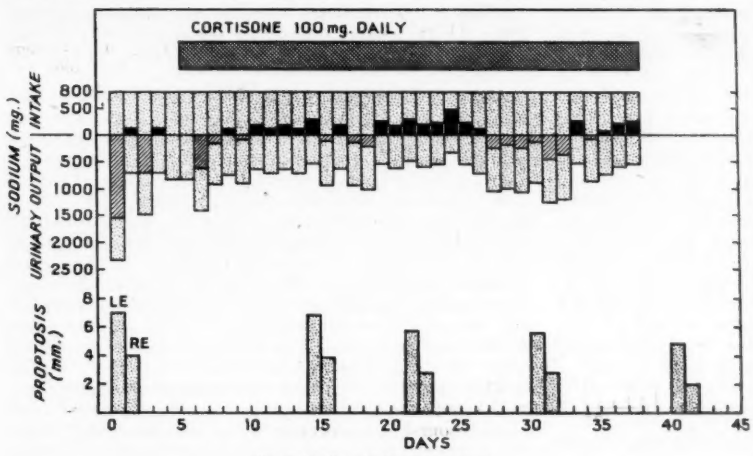

Fig. 3—Sodium balance in case 4.

an initial 3-day phase of slight sodium retention, a saline diuresis developed towards the end of the 2nd week of cortisone administration, the bulk of the sodium loss preceding the period of greatest ocular recession (fig. 2).

Follow-up.—When she was seen again 2 months after her discharge from hospital there had been some increase in proptosis.

This patient with post-thyroidectomy myxœdema and exophthalmic ophthalmoplegia showed a significant response to cortisone, with later partial relapse after treatment had been discontinued. The improvement in the local condition of the eyes was associated with increasing hypothyroidism, and could perhaps be related to the establishment of a negative sodium balance.

Case 4.—A man, aged 79, had had exophthalmic ophthalmoplegia diagnosed in 1950, when left-sided tarsorrhaphy was undertaken. He was otherwise well and active, without clinical evidence of thyroid dysfunction.

On admission in August, 1951, abnormal signs were confined to the eyes, the left eye showing well-marked œdema and 7 mm. of proptosis, with conjunctival injection and a mild blepharitis. The right eye was less severely affected, with 4 mm. of proptosis. Weakness of the ocular muscles was most evident for upward movement of both eyes, lateral movement being only slightly impaired. The B.M.R. was −18% and the blood-cholesterol level 120 mg. per 100 ml.

Treatment.—After a preliminary 6-day period of controlled sodium and fluid intake, cortisone was started at a dosage of 100 mg. daily and continued to a total of 3·3 g. in 5 weeks.

Progress.—Proptosis regressed significantly, but not dramatically, the patient remarking on the new-found sense of comfort in the eyes. Measurements of exophthalmos after cortisone was discontinued showed 5 mm. of protrusion in the left eye and 2 mm. in the right. Increase in the range of ocular movement was greatest in the inferior oblique and superior rectus muscles of both eyes. No significant change took place in the pattern of urinary sodium excretion (fig. 3). No alteration in thyroid status was clinically appreciable, and the B.M.R. after treatment was still −18%. The blood-cholesterol level was 110 mg. per 100 ml.

This patient showed slight but definite objective improvement in the eye signs and considerable subjective improvement. Sodium balance and thyroid function were unaltered.

Case 5.—A housewife, aged 50, had first noted diplopia and undue prominence of the left eye in December, 1950. She was investigated on this account by the neurological department in May, 1951, when the B.M.R. was normal. She came under our observation a few months later, when she was found to be moderately thyrotoxic (B.M.R. + 36%), with the eye signs of exophthalmic ophthalmoplegia, 6 mm. of proptosis being recorded in the left eye and 4 mm. in the right. There was gross weakness of all the ocular muscles, elevation being completely paralysed, lateral deviation severely restricted, and depression least affected.

Treatment.—She was treated with cortisone to a total dose of 2·7 g. in 4 weeks, the salt and fluid intake being controlled and the urinary excretion of sodium estimated as in the previous patients.

Progress.—The most obvious effect of therapy lay in the control of the thyrotoxicosis, the B.M.R. falling to −5%, the patient experiencing a complete remission in this aspect of her illness. The blood-cholesterol level rose from 150 to 260 mg. per 100 ml. Proptosis was uninfluenced, but there was a definite improvement in the range of ocular movement, 20 degrees of elevation being established in both eyes, together with an increase in the horizontal movement. The sodium balance was variable (fig. 4).

The experiment was to have been terminated at this stage of partial recovery, but unfortunately the patient developed a painless abscess at the site of one of her injections. This was incised a week after cortisone had been discontinued, and a general anæsthetic was administered for this purpose without our knowledge. Within a few hours of this procedure the patent complained of severe pain in both eyes, which were found to be rigidly proptosed, inflamed, and œdematous. By the same evening an exposure keratitis was developing in the left eye, where early corneal ulceration was evident the next morning. Tarsorrhaphy was performed on this eye, and treatment with A.C.T.H. was started at a dosage of 25 mg. 6-hourly. Antibiotic cover was afforded by chloramphenicol.

Improvement was extremely rapid and quite outside our previous experience of this malignant condition. Within 3 days the right eye was normal, apart from some 4 mm. of proptosis. By the 6th day the tarsorrhaphy was discontinued, and the left eye could be seen to be well out of danger. 7 days later, measurements of proptosis showed that both eyes were at their preoperative state. When a total of 1·8 g. of A.C.T.H. had been given in 18 days, this drug was "steppage-stopped" and treatment was continued with cortisone 100 mg. daily.

The patient is now attending as an outpatient for her injections of cortisone. The eye signs are much as on admission, but ocular movement has improved. Clinically she is verging on the subthyroid state and shows early "mooning" of the face, though without other evidence of cortisone overdosage.

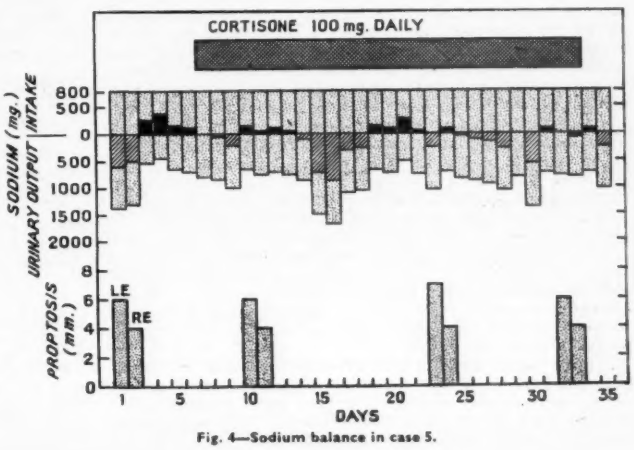

Fig. 4—Sodium balance in case 5.

In this last case the initial treatment with cortisone induced a remission of thyrotoxicosis and some small improvement in the eye signs. The development of malignant exophthalmos following the incision of an abscess under general anæsthesia was of considerable interest, both in the rapidity of its onset and in its satisfactory control with A.C.T.H. It was obviously a grave error to have exposed this patient, whose adrenal cortical function had been depressed by the previous administration of cortisone, to the stress of a general anæsthetic without the further protection of this drug. Probably another factor operating was the loss to the pituitary-thyroid relationship of the balancing action of the thyroid hormone, consequent on the control of the thyrotoxic component. In this case treatment did not significantly change the sodium balance, but these determinations were not continued during the treatment of the dramatic postoperative disturbance with A.C.T.H.

DISCUSSION

Of the five patients treated with cortisone and A.C.T.H. some improvement took place in four. In two (cases 1 and 3) the benefit obtained could fairly be rated as considerable. Case 4 showed a more modest response; and, whereas the original course of cortisone had little effect on the ocular condition of case 5, the rapid control of this patient's post-anæsthetic increase in proptosis was highly encouraging. That the improvement which follows this form of treatment may well be maintained has been shown in one instance by the follow-up of case 1. All the other patients have shown some return to their original state, but in every case some improvement persists to date.

The mechanism of improvement or partial success is far from clear. The results in relation to the balance of body sodium are inconclusive. If relief of the orbital œdema were the responsible factor for the improvement, it might reasonably be expected that only a relatively small loss of body-sodium would effect this change—an amount possibly well within the range of experimental error in a balance determination of this kind. But it is worth recalling that some of the oldest treatments for this condition aimed at securing water depletion by purgation (Means 1948), and possibly the usefulness of thyroid extract lies in its diuretic power rather than in its specific but more speculative property of inhibiting T.S.H. secretion.

The control of thyrotoxicosis was the most notable feature of the treatment of the two patients (cases 1 and 5) in whom this coexisted with exophthalmos and ophthalmoplegia.

The effect of the adrenal steroid hormones in euthyroid persons has been studied by Hill et al. (1950), who report an almost consistent depression of the I^{131} accumulation gradient, and in some a fall in the serum level of protein-bound iodine. They found that the B.M.R. either increased slightly or remained unchanged, a result which can be explained by the known calorigenic effect of cortisone and A.C.T.H., which increase the basal consumption of oxygen in man by a direct action which does not involve alterations in thyroid function (Beierwaltes et al. 1950).

Hill et al. used A.C.T.H. and cortisone in the treatment of six patients with Graves's disease, in three of whom suppression of thyroid function resulted. Their best responses were obtained in those patients who showed the greatest adrenal cortical activity and had the shortest duration of thyrotoxicosis. These same workers used A.C.T.H. in four patients with exophthalmos at a dosage of 40–80 mg. daily. All the patients experienced relief of pain, lacrimation, and chemosis to some extent, and three showed a slight decrease in exophthalmos.

Salassa (1950) treated three patients with severe exophthalmos but without definite evidence of hyperthyroidism, two of whom received cortisone 1 g. in 7 days, and the third A.C.T.H. 1·4 g. in 17 days. There was no significant change in the eye signs in any of the three patients.

In these published series, however, the duration of treatment has been short, judged by our experience, and this may have been an important factor bearing on the lack of response.

It has been suggested that two types of thyrotoxicosis exist, the first depending on hypersecretion of T.S.H., and the second a primary thyroid disorder independent of the pituitary factor. It is interesting and possibly significant that in the patients here reported where exophthalmos and thyrotoxicosis were associated (cases 1, 3, and 5) the eye signs of exophthalmic ophthalmoplegia antedated the recognition of thyrotoxicosis by periods varying from a few months to more than a year. In these cases notable improvement resulted from therapy. It would be tempting to build on this somewhat slender evidence the theory that hypersecretion of T.S.H. is the cause of this condition, and that success in treatment follows from its drug-induced inhibition. But the variable results reported by other investigators suggest that malignant exophthalmos is less easily controlled with cortisone and A.C.T.H. than is the simple thyrotoxicosis of Graves's disease. If this becomes common clinical experience, the concept of the primary ætiological rôle of T.S.H. will be less easy to sustain. Perhaps the hyperactive pituitary, believed to be implicated in exophthalmic ophthalmoplegia, is less easily restrained by increased glucocorticoid levels than is the normally functioning gland.

So far as the present study goes, more delicate tests of thyroid function are required to gain further understanding on these points. The B.M.R. is a poor indicator of thyroid function in patients receiving cortisone or A.C.T.H., and in any future work done by us the thyroid uptake and urinary excretion of I^{131} will be used instead. It is also desirable and somewhat more fundamental, if the identity of the exophthalmic principle and T.S.H. is to be accepted or disproved, that the effect of treatment be assessed in relation to any changes in the blood levels of this hormone. This demands a technique of bioassay which we intend to undertake as part of the framework of a further study.

Dobyns (1950) quotes an editorial from a medical journal written some seventeen years ago. This took to task an author who had referred to the problem of the mechanism of exophthalmos as being but little understood. The editorial writer took the firm view that sympathetic overactivity was the causal fault, and expressed the hope for a wider recognition of this fact. Nevertheless in 1952 the problem is still unsolved.

SUMMARY

An attempt has been made to assess the effect of cortisone and A.C.T.H. in exophthalmic ophthalmoplegia.

Five patients were studied. Some improvement in the ocular condition took place in four. Thyrotoxicosis was controlled in the two patients where this coexisted with exophthalmos and ophthalmoplegia.

The results in relation to sodium balance are inconclusive.

Our thanks are due to Mr. H. Moffett, who undertook the sodium estimations, and to Dr. B. Marshall, who was responsible for all the measurements of exophthalmos. We would also like to acknowledge the coöperation received from the Sisters and nurses on the medical wards of the Infirmary and from the patients themselves. We are indebted to the Medical Research Council for the cortisone.

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EFFECT OF SPLENECTOMY IN A CASE OF CONGENITAL PORPHYRIA

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CONGENITAL porphyria is a very rare disease which is probably inherited as a mendelian recessive and is characterised by extreme photosensitivity and the excretion of large amounts of uroporphyrin I and coproporphyrin I in the urine and of coproporphyrin I in the fæces. Photosensitivity may occur in other conditions without the excretion of abnormal or excessive porphyrins and also in varieties of porphyria in which smaller quantities of porphyrins are excreted. These have been investigated less completely than classical congenital porphyria, and their relation to this condition remains obscure. The earlier investigations of congenital porphyria were made by Fischer (1915a and b, 1916), by Borst and Königsdorffer (1929), and in this country mainly by Garrod (1923). A new tool for further research into the condition was provided by the discovery of isotopes and by the important discovery of Shemin and Rittenberg (1946) that the nitrogen of glycine was the specific precursor of the nitrogen atoms in the protoporphyrin of circulating hæmoglobin.

Three independent groups of workers (Grinstein et al. 1949, London et al. 1950a, Gray and Neuberger 1950) have fed glycine labelled with N^{15} to patients with congenital porphyria and found high isotope contents in the excreted porphyrins, thus showing that glycine is specifically utilised in the biological synthesis of type-I porphyrins as well as of the type-III porphyrin of hæmoglobin. The labelled porphyrin of the circulating hæmoglobin is greatly diluted with unlabelled material formed before administration of the isotope, but analysis of the data suggests that protoporphyrin, coproporphyrin, and uroporphyrin are derived from a common precursor.

Some differences were found with respect to the changes of isotope content of the hæm of the circulating hæmoglobin with time. The British workers (Gray, Neuberger, and Sneath 1950) performed two separate experiments, in the first of which evidence was obtained suggesting the presence of a proportion of red cells of short life-span. This was in accordance with the relatively low hæmoglobin content and the reticulocytosis. In the second experiment the hæm-isotope curve was almost normal and the slight anæmia had subsided. The New York workers (London et al. 1950a) observed a moderate reticulocytosis associated with a normal hæm isotope curve. On the other hand, the patient studied by the Minneapolis group (Aldrich et al. 1951, Grinstein et al. 1951) had severe hæmolytic anæmia, splenomegaly, reticulocytosis, and greatly increased urobilinogen excretion in the fæces; the isotope results suggest that this patient also had some red cells of very short life-span.

These findings, together with the earlier report on the case Petry (Weiss 1925, Guenther 1925) and those of Mackey and Garrod (1926) on the present case, suggest that the association between congenital porphyria and hæmolytic anæmia is not incidental. Mackey and Garrod suggested that anæmia was not always present, because the increased rate of destruction of red cells was balanced by enhanced erythropoiesis.

Isotope studies have also shown (London et al. 1950b, Gray, Neuberger, and Sneath 1950) that in normal man 20–25% of the fæcal bile pigment is derived otherwise than by the destruction of red cells at the end of their normal life-span of 120–130 days. Thus, if N^{15}-labelled glycine is given to a normal person, the stercobilin is highly labelled during the first few days after isotope feeding as well as when the labelled red cells are being broken down. There is also small but significant labelling between these two periods. A possible source of the bile pigment not derived from circulating mature red cells has been discussed at length (Gray, Neuberger, Sneath 1950), and it appears probable that a substantial proportion is associated with hæmoglobin formation.

We originally suggested that this bile pigment might be derived from the breakdown of hæmoglobin, metabolically labile because of the immaturity of the red cells in bone-marrow, which may be katabolising as well as synthesising hæmoglobin. However, there is an alternative explanation. In the maturing red cells of mammals the rates of porphyrin or hæmatin formation and globin synthesis are on the average fairly well adjusted, and there is no great excess of either. However, some cells may produce a relative excess of hæmatin or of globin. Excess of globin will lead to hydrolysis, and the liberated amino-acids will join the "protein pool," but hæmatin produced in excess will be largely eliminated in the form of bile pigment. This suggestion is supported by the observation that hæmatin is converted into bile pigment (London 1950).

In congenital porphyria about 80% of the bile pigment is derived from the source associated with hæmoglobin formation, and only about 10–20% is derived from red cells at the end of their normal life-span. Since porphyrins of type I do not give rise to stercobilin, it is clear that in congenital porphyria, in addition to the increased formation of uroporphyrin and coproporphyrin, there is a derangement in the formation of the "normal" porphyrin of type III.

No rational treatment of congenital porphyria has so far been possible. The association between anæmia and porphyria discussed above, the general deterioration in our patient's condition, and the report by Watson (1950; see also Aldrich et al. 1951) of the beneficial effect of splenectomy in a possibly atypical case, suggested that our patient might be benefited by the removal of his spleen. We have also investigated the effect of treatment with riboflavine, which according to Stich (1950) decreases the excretion of porphyrin in urine and fæces.

OBSERVATIONS BEFORE AND AFTER SPLENECTOMY

The detailed history of our patient has already been described (Gray and Neuberger 1950, Gray, Neuberger, and Sneath 1950, Gray, Muir, and Neuberger 1950). He was investigated earlier by Mackey and Garrod (1926). Since the first isotope experiments were made, his general condition has deteriorated and he has been found to have low-grade uræmia (blood-urea level 80 mg. per 100 ml.), although the blood-pressure was normal. Albuminuria is now present, but there has been no history suggesting renal disease.

The hæmatological data kindly supplied by Dr. W. M. Davidson are summarised in table I.

The isotope experiment was performed as described in our earlier papers.

Urinary uroporphyrin was determined on twenty-four-hour collections by the method of Sveinsson et al. (1949). "Urobilinogen" in fæces was estimated by the method of Schwartz et al. (1944), which measures all substances soluble in light petroleum and reacting with *p*-dimethylamino-benzaldehyde under specified conditions and in addition any

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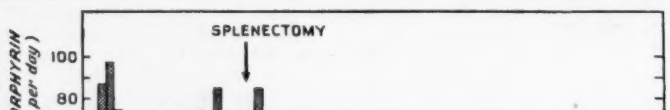

Fig. 1—Urinary uroporphyrin excretion before and after splenectomy

substances which behave similarly after reduction with ferrous ions in an alkaline medium.

The administration of riboflavine had no significant effect on the urinary porphyrin excretion. Previous investigations in this case have shown that injections of ascorbic acid, pyridoxine, 'Plexan,' folic acid, vitamin-B_{12} concentrates, and crude liver extract had no apparent effect on the condition judged by qualitative tests.

Effect of Splenectomy

Urinary porphyrin excretion.—Splenectomy was performed by Mr. H. C. Edwards, on Jan. 19, 1951. Fig. 1 shows the urinary porphyrin excretion before and after the splenectomy. During the first three days after the operation the porphyrin excretion fluctuated considerably owing to variations in urinary volume. The mean preoperative excretion was 73 ± 13 mg. a day. During the following fifteen days the excretion had fallen to an average of 26 ± 6 mg. a day, but during the next thirty-one days this gradually increased, making the mean excretion during this time 47 ± 28 mg. a day. Six months after the operation the average excretion had risen to 61 mg. a day.

It therefore seems that splenectomy led to a temporary diminution in porphyrin excretion, which, however, was not sustained, although the values six months after operation were still somewhat lower than before.

Isotope data.—The patient was given 12 g. of glycine containing 31·6 atom % excess N^{15} in twelve doses $2^1/_2$-hourly, beginning at 6 A.M. on Feb. 5, 1951. Fig. 2 shows the isotope content of the hæm plotted against time. Though the shape of the curve is normal and similar to that obtained in the second isotope experiment described previously, quantitatively the highest isotope content reached is only about half of the corresponding figure obtained when the same quantity of isotopic glycine was fed before operation. There was no evidence of the presence in the circulation of red cells with a very short life-span.

Table II shows the incorporation of N^{15} into the urinary uroporphyrin. A comparison with the figures obtained in the previous experiments shows that no significant change has taken place. The incorporation of the isotope into the fæcal coproporphyrin gave values approximating closely to those obtained in the two earlier experiments done before splenectomy. The stercobilin results, which are also shown in table II, are of particular interest and show clearly that a disturbance of porphyrin metabolism, which is reflected in the high isotope content of stercobilin immediately after labelled glycine feeding, has not been affected by the splenectomy.

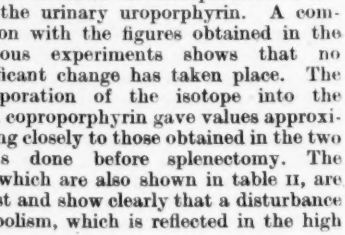

Fig. 2—Incorporation of N^{15} into haem after splenectomy.

Fæcal "urobilinogen" excretion.—Table III shows that the urobilinogen excretion was above the normal range before splenectomy. Immediately after splenectomy there was a definite decrease, which was, however, only temporary, the figures which were obtained five months after splenectomy tending again to be higher.

DISCUSSION

The results with riboflavine show clearly no noticeable effect on porphyrin excretion in our patient, and are at variance with those of Stich (1950), who claimed that

TABLE I—HÆMATOLOGICAL DATA

Date	Red cells (million per c.mm.)	Hb. (g. per 100 ml.)	Colour-index	Leucocytes (thousand per c.mm.)	Differential count (%)			Remarks
					Polymorphs	Lymphocytes	Monocytes	
18/2/49	4·6	11·9	1·0	3·1	57	37	6	Packed cell volume 39%; mean corpuscular volume (M.C.V.) 102 cμ; mean corpuscular Hb conc. (M.C.H.C.) 32%; red cells show anisocytosis and poikilocytosis; 3 nucleated red cells in 100 white cells
3/3/49	4·0	11·9	1·0	4·2	57	33	9	M.C.V. 90 cμ; M.C.H.C. 33·5%; reticulocytes 4·8%; red cells show some anisocytosis and poikilocytosis; erythrocyte-sedimentation rate (E.S.R.) 11·5 mm. in 1hr. (Wintrobe)
19/5/49	..	12·7	..	3·6	59	31	9	Red cells show anisocytosis and poikilocytosis; reticulocytes 0·7%
31/10/50	..	12·2	..	5·8	73	16	10	M.C.H.C. 35%; reticulocytes 4·9%; E.S.R. 38 mm. in 1 hr. (Wintrobe); red cells show little anisocytosis
13/12/50	4·6	11·3	0·8	3·9	61	26	12	M.C.V. 80 cμ; M.C.H.C. 30%; reticulocytes 5·8%; red cells show considerable anisocytosis
19/1/51				Splenectomy				
26/1/51	..	12·2	..	10·5	57	14·5	20·5	Reticulocytes 12%; red cells show some increase in anisocytosis and very definite punctate basophilia
5/2/51	3·6	11·6	1·08	8·9	47·5	19	22	Red cells show considerable anisocytosis; definite punctate basophilia accompanied by numerous nuclear fragments; occasional normoblasts; platelets increased
12/7/51	4·22	12·2	1·0	10·6	42	30	26	Reticulocytes 12·4%; normoblasts 9/100 white cells; moderate anisocytosis; slight poikilocytosis

this vitamin caused an almost complete and sudden disappearance of porphyrin from the urine of a patient with congenital porphyria. Unfortunately, no clinical data are available concerning his patient(s).

The favourable effect of splenectomy in certain hæmolytic anæmias is well known but not completely understood. In our patient, whose anæmia was not severe, splenectomy was followed by a considerable fall in fæcal "urobilinogen," although there was little change in the hæmatological findings; reticulocytosis in particular was not diminished.

The high isotope content of the fæcal stercobilin also suggests that at least 60% of the total fæcal bile pigment is derived from sources other than the breakdown of the hæmoglobin of red cells which had disintegrated at the end of their normal life-span. Since the total mass of circulating red cells may be presumed to be only slightly lower than normal, and most of the cells had an apparently normal life-span, the amount of bile pigment produced by the katabolism of hæmoglobin of normal cells must have been about 80% of that found in a normal person.

On the other hand, a comparison of the isotope contents of the urinary uroporphyrin with that of fæcal stercobilin suggests that only about 20%, or at the most 40%, of the total stercobilin was derived from this source. It was thus to be expected that the total urobilinogen excretion in the fæces should be at least twice and possibly five times the normal figure. However, the values found immediately after splenectomy are well within the normal limits.

The quantitative interpretation of urobilinogen excretion in terms of hæmatin breakdown is not at all easy. If all the prosthetic group made available by disintegration of hæmoglobin were converted into fæcal urobilinogen the average daily excretion of the latter should be about 300 mg., in view of the fact that the total amount of hæmoglobin in the body of the adult is about 700 g. and the average life-span of the red cell about 125 days. In fact, the values found in normal people are very much smaller, and this point has been commented on by several workers (Watson 1937, Singer 1945, Lemberg and Legge 1949). In the present case isotope contents of stercobilin found before splenectomy suggested increased breakdown of hæmoglobin which had not yet reached the circulation, whereas the urobilinogen excretion was only increased to a moderate extent. It thus seems that the diminished urobilinogen excretion, which was observed immediately after splenectomy, does not necessarily indicate that bile-pigment formation was decreased to any great extent by splenectomy.

TABLE II—ISOTOPE CONTENTS OF URINARY UROPORPHYRIN AND FÆCAL STERCOBILIN FOLLOWING THE ADMINISTRATION OF ISOTOPIC GLYCINE

Glycine (12 g.) containing 31·65 atom % excess N^{15} was fed on days 1–4 in the experiment before splenectomy, but after splenectomy was fed during the first 28 hours of the experiment

Urinary uroporphyrin

Day of experiment	N^{15} content atom % excess	
	Before splenectomy	After splenectomy
1	0·370	0·537
2	1·00	2·106
3	1·50	2·091
4	1·90	1·420
5	1·95	1·041
7	1·26	0·865
8	1·08	—
9–10	0·93	0·601

Fæcal stercobilin

Before splenectomy		After splenectomy	
Days of experiment	N^{15} content atom % excess	Days of experiment	N^{15} content atom % excess
1–4	1·16	2–5	0·476
5–8	1·30	6–9	1·282
9–12	1·36	10–13	0·552

TABLE III—DAILY FÆCAL EXCRETION OF UROBILINOGEN OF PATIENT AT VARIOUS TIMES

Values represent daily averages of 4-day collections

Date	Fæcal urobilinogen (mg. per day)
Before splenectomy:	
Feb. 15–19, 1949	316
,, 19–23, 1949	226
,, 23–27, 1949	350
Dec. 1–5, 1949	418
,, 9–13, 1949	252
Jan. 19–24, 1950	238
Immediately after splenectomy:	
Feb. 6–9, 1951	87
,, 9–13, 1951	150
,, 15–18, 1951	132
5 months after splenectomy:	
July 10–14, 1951	175
,, 14–17, 1951	341

One further point is worthy of mention: the greatest incorporation of N^{15} into the protoporphyrin of the circulating hæmoglobin was very much higher before splenectomy than was found when similar amounts of isotopic glycine were fed to normal persons or to the patient after splenectomy. It is unlikely that the relatively mild hæmolysis observed in this patient in earlier experiments can account for this phenomenon, and the reason for this high isotope incorporation into hæm and the relative decrease in this last experiment remains obscure.

The reported cases suggest that the fundamental defect in porphyrin synthesis is not affected by the removal of the spleen.

The young girl with congenital porphyria and severe hæmolytic anæmia who was studied by Aldrich et al. (1951) benefited considerably by splenectomy. Anæmia and the sensitivity of the skin to sunlight disappeared, urinary and fæcal porphyrin excretion were greatly reduced, and urobilinogen excretion decreased to normal values. But the metabolic defect consisting of the production of abnormal amounts of coproporphyrin I and uroporphyrin I persisted.

de Marval and Pons (1934) also reported the effects of splenectomy on congenital porphyria. They noted that, though the metabolic defect of porphyria was unchanged, hæmolytic acitivity was greatly reduced, and the sensitivity of the skin to light was decreased.

Aldrich et al. (1951) refer to unpublished observations of Zuelzer and Kaplan on yet another case of congenital porphyria with hæmolytic characteristics. Splenectomy in that patient produced only a temporary improvement in the hæmolytic anæmia, without affecting the underlying porphyria. The skin sensitivity was apparently not altered.

The amount of porphyrin excreted was found to be reduced in the two cases where quantitative measurements were made (in our case this reduction was rather small and temporary); skin sensitivity was not affected in two cases, was improved in one case, and was completely abolished in another case. In our patient, in whom anæmia was slight, hæmatological findings were not affected by splenectomy; in the other cases, where the anæmia was severe, the hæmolytic condition was either improved or abolished. But this remission may only be temporary. It thus seems that splenectomy

as palliative treatment may be of value only in congenital porphyria associated with severe hæmolytic anæmia.

SUMMARY

A short review is given of our present knowledge of porphyrin metabolism in congenital porphyria, and evidence showing that the production of large amounts of porphyrins of type I is due to an abnormality in the production of hæmoglobin is summarised.

The association with hæmolysis or hæmolytic anæmia often found in congenital porphyria is thus considered not to be fortuitous.

Splenectomy reduced somewhat the excretion of porphyrin in the urine and of urobilinogen in the fæces, but the hæmatological findings and the sensitivity of the skin to light were not affected by the operation.

We wish to thank Miss M. Pickett and Mrs. B. Higginson for experimental assistance, the Medical Research Council for an expenses grant to C. H. G., the central research fund of the University of London for the purchase of a Spekker absorptiometer, and Dr. R. Bentley and Mr. G. Dickinson for mass spectrometer analyses. We are particularly grateful to Dr. W. M. Davidson, of the Department of hæmatology, Kings College Hospital, for his permission to report the hæmatological data.

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Medical Societies

MANCHESTER MEDICAL SOCIETY

Control of Bleeding during Surgical Operations

THE section of anæsthetics of the Manchester Medical Society met on March 13 to discuss the control of bleeding during surgical operations.

Dr. C. E. SYKES, opening the discussion, said that the interest of anæsthetists in the methonium compounds was first aroused in 1948 by the experimental work of Paton, Zaimis, and Organe, who found that pentamethonium iodide (c5) intravenously had little effect on a patient who was lying down, but caused a fall in blood-pressure when he stood up. Other workers observed dilatation of the pupil, often persisting for twenty-four hours. The fall in blood-pressure was greater in the hypertensive patient, and vasodilatation was greater in the legs than in the arms. Hexamethonium iodide (c6) seemed more reliable than pentamethonium iodide.

There is no hard and fast rule for dosage, but the systolic blood-pressure should fall to 70 mm. Hg. To achieve this in a healthy adult, 30 mg. may be required, followed when necessary by doses of 20 mg. For old or hypertensive patients 10–20 mg. is usually sufficient.

Posture on the operating-table is important; the site of operation should be the highest part of the body. On return to bed the blood-pressure should be allowed to rise slowly to avoid reactionary hæmorrhage.

Electrocardiographic records have shown no ill effects, but cases with coronary-artery disease should not receive these drugs.

The methonium compounds are normally excreted by the kidney, and consequently they should not be given when renal function is poor. Their use should still be regarded as purely experimental.

Dr. W. B. BACON said that bleeding under anæsthesia could be reduced by controlled hypotension following the use of methonium compounds. These drugs paralyse the autonomic ganglia, and the consequent dilatation of the vascular system has the immediate effect of decreasing peripheral resistance and reducing blood-pressure. Posture is of paramount importance in ensuring a dry surgical field; the site for surgery must be placed at the highest possible level, and sufficient time must be allowed for gravity to drain the blood from this area.

Operations on the head, neck, and thorax are performed with a 20°–30° feet-down tilt. The lateral jack-knife position is used for operations in the region of the hip, and the prone jack-knife for surgery of the spine. For pelvic surgery, after a preliminary "reverse Trendelenburg tilt" to drain blood into the legs, the legs are flexed and the full Trendelenburg position used to drain blood out of the pelvis. Operations in the lithotomy position—e.g., colporrhaphy—are difficult, because it is obviously impossible to position the site of surgery at the highest point. Fair results are obtained by using a full Trendelenburg position for some minutes, and by elevating the legs in the stirrups *before* levelling the patient.

During a general anæsthesia combined with hexamethonium the blood-pressure falls first after premedication, then after thiopentone, and finally to 60–70 mm. Hg after hexamethonium. There is no appreciable rise in pressure until four or five hours after administration. Falls in blood-pressure are greatest (and often alarming) in the aged and the hypertensive; the young, nervous, and hypotensive type, on the other hand, is difficult to control. The dose of hexamethonium can be judged only by experience; 0·5 mg. per kg. may be sufficient for the hypertensive, but may have to be increased threefold for the young or nervous patient. A half-dilated pupil may be taken as a sign of adequate dose. The fall of pressure under premedication and thiopentone will give a good indication of the dose required; the larger the fall, the smaller the dose of hexamethonium. Once the ganglia are paralysed, more hexamethonium has no effect.

It is difficult to control blood-pressure by methonium; this is done either by changing the position of the patient—e.g., lowering the head—or by giving pressor drugs—e.g., 'Methedrine.' Methedrine must be given in doses not exceeding 5 mg., well diluted and very slowly, otherwise it may cause a very rapid rise in blood-pressure. The patient must have plenty of oxygen throughout anæsthesia.

Many everyday faults may contribute to the cause of bleeding—for example: hurried induction, or gagging after the short-acting relaxants; a partially blocked expiratory valve; failure to restore full tidal volume when respiration has been depressed by relaxants, or by lithotomy or deep Trendelenburg positions; failure to blunt sensory stimuli from the operation which release adrenaline, so raising the blood-pressure and causing bleeding.

Under hexamethonium the patient is completely devoid of vasomotor control: all movements must be carefully supervised, particularly between the operating-table and the ward. The anæsthetist must see the patient

back to bed, and be satisfied with his condition; oxygen must be at hand and the blood-pressure must be carefully watched. A reactionary hæmorrhage might be obscured by the effect of the ganglion block on the pulse-rate, but it would be detected by a fall in blood-pressure.

Dr. M. SWERDLOW wondered whether the production of a bloodless field by means of methonium compounds was just a "clever trick," or did it offer advantages over existing methods of anæsthesia, outweighing any added dangers? He advised caution in the selection of cases, care in the application of the technique, and close supervision of the patient in the immediate postoperative period. The hæmoglobin should always be measured before operation and any anæmia corrected to ensure maximum possible oxygen carriage during the period of hypotension.

He thought that in ear, nose, and throat surgery controlled hypotension was more justifiable; patients are mostly in the younger age-groups, and the site of operation allows a satisfactory anti-Trendelenburg tilt and a high degree of ischæmia.

In a general discussion, fears were expressed about the risk of reactionary hæmorrhage, especially when induced hypotension was used in thyroidectomy. Kidney damage may follow prolonged hypotension, and anuria had occurred in some patients. On the other hand, evidence was given to suggest that venous pressure was little affected by the ganglion-blocking drugs, though it fell sharply after loss of blood.

New Inventions

PROTECTIVE SHIELDS FOR ULCER SCARS

THE scar where a so-called "varicose ulcer" has been present often appears to break down if the area is chafed or knocked, and for some time I have been searching for a suitable shield which the patient may wear to protect the vulnerable area.

Such a shield has recently been made for me and is depicted here. Made of 'Perspex,' it may be kept in place with a light garter, or with tapes (see figure). The

shield is light, its edges are specially moulded, and the holes with which it is perforated allow of some ventilation. If necessary an elastic stocking can be worn over the shield.

It is not suitable for all persons, but is very useful for selected cases; obviously care must be taken to see that the garter or tapes are not too tight.

The shields have been made by Messrs. J. Drew, 55, Dorset Street, London, W.1.

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Reviews of Books

New Worlds and Old

CHARLES SINGER. London: Heinemann Medical Books. 1951. Pp. 178. 15*s*.

IN this volume of thirteen essays the doyen of medical historians has put together some thoughts on the frontiers between science on the one hand and philosophy, religion, tradition, and history on the other. Medical readers will be particularly interested in the account of Francis Adams, a Scottish country doctor who was a self-taught classical scholar.

While in practice at Banchory in the wilds of Deeside, Adams produced famous translations of the works of Hippocrates, Paulus Aeginata, and Aretæus the Cappadocian. "His masterpiece *The Seven Books of Paulus Aeginata by Francis Adams* retains to this day its position as far and away the finest venture in pure historical medical research in the English language. It is more than a translation, more than a commentary. The extensive and accurate notes that accompany it trace the practice of Paul backward into remoter antiquity and forward into medieval times. They make it in fact a reference book to the whole history both of Greek and Arabian medicine."

Adams had a peculiar mode of working. When he returned home from his rounds in the late afternoon he would have his supper, collect such books as were specially interesting him, and retire with them at once to bed. He fell asleep immediately and slept for about two hours. He would then awake and work through the night, falling asleep for three or four hours before rising in the morning. He did not begin to see his patients till about ten.

Other readers may prefer the essays on Copernicus, Vesalius, Robert Hooke, Aristotle as a naturalist, or the botany of Theophrastus. They form a stimulating, profound, and readable collection that will add fresh lustre to their author's name.

Ear, Nose, and Throat Diseases for the General Practitioner

WILLIAM MCKENZIE, M.B., F.R.C.S., surgeon, Royal National Throat, Nose and Ear Hospital. Edinburgh: E. & S. Livingstone. 1952. Pp. 133. 9*s*.

Mr. McKenzie, with past experience of general practice, sets out to put into a small volume such facts as a general practitioner most needs to know about ear, nose, and throat diseases, and to help him give or procure appropriate treatment for patients with these complaints. The book is simply and pleasantly written and the points made are emphasised by case-notes. The general plan is good: common disorders are given suitable priority, and history and symptoms are emphasised rather than signs. These last, indeed, are sometimes neglected: for example, little is said about the appearance of the drums in acute otitis, and nothing at all about that of the throat in carcinoma of the pyriform fossa or the tonsil. Much of the advice (e.g., on the indications for tonsillectomy) is helpful, and there is a justified plea for information in doctors' letters; but some details seem questionable.

"A quinsy," for the author, "is a peritonsillar abscess which has burst or been incised"; and "the expression mastoiditis is limited by otologists to those cases which need operation." Surely a peritonsillar abscess is a quinsy, and inflammation of the mastoid cells is mastoiditis, regardless of course or treatment. Like some other otologists Mr. McKenzie seems scarcely to recognise the very common early acute otitis media of childhood, with pain and fever an hour or so old and a red upper half of the drum. Before chemotherapy many such ears went on to discharge or needed myringotomy, while some progressed to mastoiditis; now almost all subside quickly and lastingly with sulphonamides; (penicillin, with its needle pricks, is rarely required). The subacute catarrhal otitis of childhood with recurrent slight earache and deafness is mentioned only as a symptom of adenoid infection. Epistaxis and its treatment are described without regard to the patient's age: "If the bleeding has not stopped the patient should be sent to bed and given morphia gr. $^1/_4$ at once." Perhaps no general practitioner would apply this advice to a child, but even for an adult

compression of the nostrils while sitting up might be worth trying. It is hard to believe that "Eustachian catheterisation is successful only in a few cases of middle ear deafness caused by infection."

With revision this book, at present unequal, might become a very good one.

A Dictionary of Antibiosis

LEONARD KAREL and ELIZABETH SPENCER ROACH. New York: Columbia University Press. London: Oxford University Press. 1951. Pp. 373. $8.50. 55*s*.

THE authors of this useful work are members of the staff of the Division of Research Grants, in the National Institutes of Health of the United States Public Health Service. They have winnowed the scientific publications of the world for information about the search for antibiotics. The result is a list of the several thousand plants from which antibiotics have already been sought, the microscopic test organisms used, the methods of extraction, the substances extracted, and the chemical and physical properties, and the ranges of organisms against which they are effective or ineffective, either in vivo or in vitro. The references are given in a bibliography, and the volume should be very valuable in preventing waste of time and effort of investigators in this field.

Die Innersekretorischen Krankheiten des Kindes und ihre Behandlung

Professor Dr. ERWIN THOMAS, late medical director of the City Hospital for Women and Children (Keetmans foundation) Duisburg. Stuttgart: Ferdinand Enke. 1951. Pp. 136. D.M. 12.40.

Professor Thomas has long been well known for his contributions to German textbooks and other publications. In this little book he attempts to review, for the pædiatrician, the progress of endocrinology over the last ten years. He describes the functions and diseases of the sex glands, pancreas, suprarenals, thyroid, parathyroids, thymus, pituitary, and pineal gland and mentions many other conditions of more uncertain origin. A great many facts are given in a small space, but the resultant telegraphic style does not make for easy reading. The exhaustive reference list and the frequent quotation of opposing views indicate how often many current assumptions are questionable. The discussion of diseases not obviously endocrine in origin, such as resistant or renal rickets, Fanconi syndrome, and cystinosis, illustrates the tendency to attempt too much. On the other hand, the amount of necessarily incomplete information is in itself a spur to further study.

Portrait of a Surgeon

ERNEST A. GRAY, senior bacteriologist in the National Agricultural Advisory Service. London: Robert Hale. 1952. Pp. 219. 16*s*.

THIS biography of John Hunter seems to be a mixture of fact and fiction; nor is it easy to distinguish them, for the facts are by no means all correct. William Chesselden is referred to throughout as Richard. Matthew Baillie and Sir Richard Croft are stated to have married the daughters of John Knyveton, whereas really they married the daughters of Thomas Denman. The real surprise of the book is the introduction, as a "lifelong friend" of John Hunter, of this John Knyveton, with extracts from an alleged diary which we strongly suspect is wholly or mainly fictitious, and centred in the life of Denman (as seems to be borne out by the reference in the index to "Denman vide John Knyveton.") The author has elsewhere admitted that Knyveton is an imaginary name, and has described the "diary" as "an expansion of an original document that is not of great length" and as "an expansion of the preface of a famous 18th century work." He has never to the best of our knowledge published the bare original text (though he has now expanded it to three full-length books). It is quite unjustifiable to incorporate material of this kind in what pretends to be an authentic biography; but if the book is not regarded as a serious biographical work, and its oddities are overlooked, it is interesting and readable.

The Physician: *As man of letters, science and action* (2nd ed. Edinburgh: E. & S. Livingstone. 1951. Pp. 259. 21*s*.).—This short book by Prof. T. K. Monro will be useful to the student of the history of medicine. It brims over with facts about doctors of all periods and races, presenting, in scholarly and pithy English, an epitome of international medical biography.

The Merck Index of Chemicals and Drugs (6th ed. Rahway, N.J.: Merck & Co. Inc. 1952. Pp. 1167. $7.50).—This elegant edition of a reference book which first appeared in 1889 has been revised to include the advances of the past 12 years. Sections on the properties and uses of radioactive isotopes are among the new features which will commend it to those who seek concise and up-to-date information on the chemistry of drugs. The binding, we are told, is resistant to mildew: but the other qualities of the book make it unlikely that it will be neglected long enough to put this particular one to the proof.

Tuberculosis Among Children and Adults (3rd ed. Oxford: Blackwell Scientific Publications. 1951. Pp. 894. £4 15*s*.).—Those who favour the use of B.C.G. for protective inoculation against tuberculosis will find in this volume a clear statement of the "other side of the question," for Prof. J. Arthur Myers places great reliance on the value of a naturally occurring Mantoux-positive reaction in tuberculosis control and prevention. B.C.G., in his opinion, not only has intrinsic limitations, but by inducing a positive tuberculin test makes it impossible to distinguish the infected from the uninfected. The third edition of his book has not so much been revised as extended; all the modern work since 1938 is collected in part IV, new to the book, and occupying about half of it. Collaborators have added chapters on treatment by artificial pneumothorax, thoracoplasty, and lung resection. It is, however, in the sphere of epidemiology that the interest of this book lies, and the reader will learn much from it about one section of American opinion.

A Doctor's London (London: Allan Wingate. 1952. Pp. 112. 13*s*. 6*d*.).—This interesting and entertaining book has been written with relish by a well-known doctor who is also a scholar and a journalist, and who uses the pseudonym of Harvey Graham. He gives a lively account of many features of London medical life, including Harley Street, the Hunterian Society, the Royal College of Surgeons, the National Institute of Medical Research at Mill Hill, and the Royal Hospitals, interspersed with historical details, engaging stories, and a remarkable series of illustrations. Not the least interesting sections deal with lesser-known places such as the licensed houses "The Rose of Normandy," and "The Book," whose proprietor was responsible for the advertisement "If anyone asks you where the British Museum is, it's opposite 'The Book.'" The personalities are as varied. William Hunter working in his school of anatomy, now the stage of the Lyric Theatre; Rahere; John of Mirfield; Dr. Graham, the most famous of all charlatans; Mary Toft, the rabbit-breeder; Daniel Lambert, who weighed 52 st.; giants, dwarfs, centenarians, and hypnotists. The omission of any real account of the Royal College of Physicians seems remarkable and the author has some tendency to use slang words unnecessarily and to wander far away from London. But anything can be forgiven to a teller of good stories.

Textbook of Pharmacognosy (2nd ed. London: J. & A. Churchill. 1951. Pp. 556. 35*s*.).—The scope of pharmacognosy (literally the knowledge of drugs) is wide and difficult to define. At first sight it looks like a synonym for materia medica; and Hale-White, in his classical work on that subject, described it as "materia medica proper . . . the knowledge of the natural history, physical characters, and chemical properties of drugs." Mr. T. E. Wallis, on the other hand, distinguishes four departments of the study of drugs—pharmaceutical chemistry; pharmacy or pharmaceutics; pharmacology or pharmacodynamics; and pharmacognosy, which he defines as "the scientific study of the structural, physical, chemical, and sensory characters of crude drugs of animal and vegetable origin, including their history, cultivation, and collection and . . . other treatment they receive . . . from the producer to the distributor or pharmacist." His book contains careful and detailed descriptions, macroscopical and microscopical, of the traditional drugs in their crude (i.e., natural) state, generously illustrated with admirable line drawings. The final sections, on the commercial aspects, including cultivation, insect pests, adulteration, and standardisation, are brief but succinct.

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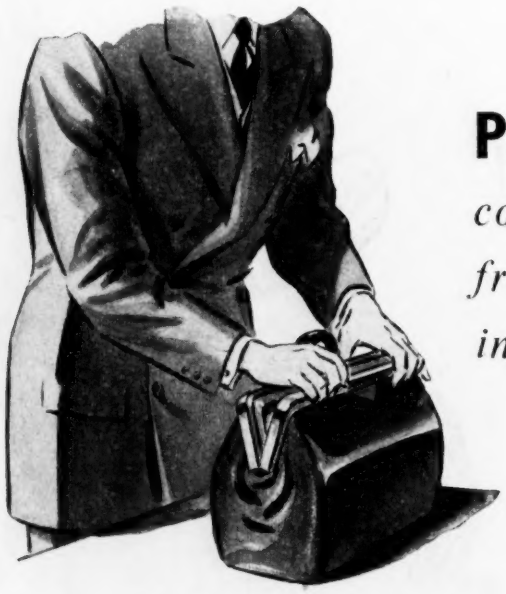

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THE LANCET

LONDON: SATURDAY, APRIL 26, 1952

Cœliac Disease and Wheat

FOR many years it has been customary to treat cases of the cœliac syndrome with diets devoid of complex carbohydrates such as starch. This dietetic therapy was based on clinical observation rather than on metabolic studies. WILFRID SHELDON,[1] in twelve-day fat-balances on 15 patients, found that removal of starch from the diet was associated with a significant rise in fat absorption; and dextrin behaved like starch.[2] This work was confirmed and extended by MAY,[3] who before the war had shown that rich sources of vitamins of the B complex, such as yeast, improved the absorption of vitamin A in cœliac disease. He noted that the defect in fat absorption when cereal was given persisted despite the administration of the B complex and was accompanied by retention of sodium and even greater retention of chloride.

Unfortunately in these and other studies the content of complex carbohydrate in the diet was not the only factor that was varied: when starch was eliminated so was wheat gluten. The significance of this has now been made apparent by two very important studies from Holland. Starting with observations in the famine from September, 1944, to May, 1945, when wheat and rice were not to be had in the Western Netherlands, DICKE [4] noted that patients with cœliac disease improved when wheat and rye flour were excluded from their diet but could nevertheless tolerate large quantities of wheat starch, potatoes, or rice-meal. In fact, the intolerance was not to starch but to some other substance present in wheat flour. The work of VAN DE KAMER and his associates in the Central Institute for Food Research in Utrecht has supplemented the findings of DICKE. Thus WEIJERS and VAN DE KAMER [5] have studied fat absorption in normal and abnormal infants and children with special reference to the cœliac syndrome. Their technique is essentially to determine changes in blood-lipids after an oral test dose of fat—estimating blood-fat, vitamin A, and chylomicrons—and to determine fat in the fæces. By "absorption" is meant the difference between fat ingested and fat, excreted: they emphasise that in a normal human being the fæcal fat consists for the greater part of endogenous fat. In the cœliac syndrome butter-fat which is composed mainly of the higher saturated fatty acids, was not well tolerated; for in this condition the saturated fatty acids are badly absorbed, whereas the unsaturated fatty acids are almost completely absorbed. When these patients were given olive oil, which contains only 10% of saturated fatty acids, most of the fat was absorbed and the condition was much improved. Unlike the normal child, therefore, the cœliac patient has a different degree of toleration for fatty acids of different saturation. When they proceeded to follow up DICKE's observation on the injurious effect of wheat flour, the Utrecht workers found that the presence of wheat flour in the diet did not affect the absorption of unsaturated fatty acids but did increase the excretion of saturated fatty acids: indeed, when olive oil and wheat flour were given to patients with cœliac disease much greater quantities of saturated fatty acids were excreted than were ingested. Even on a fat-free diet the patient excreted fat, if his food included wheat flour. In three cases investigated, nicotinamide counterbalanced the injurious effects of wheat flour.

VAN DE KAMER and his associates concluded that a defect in absorption would not explain the facts, and that in cœliac disease there must be some disturbance in the intermediate metabolism of fat—a disturbance particularly affecting saturated fatty acids. But Professor FRAZER and his team at Birmingham, whose paper we are happy to publish this week, reach a different conclusion. They fully agree about the great improvement in patients with cœliac disease whose diet is freed from wheat flour; and they have notably extended the observations of DICKE and of WEIJERS and VAN DE KAMER by showing that it is the gluten of wheat flour that is injurious. (The various clinicians who have obtained benefit by decreasing dietary starch have done so, it appears, because they have unwittingly decreased dietary wheat gluten at the same time.) The difference of opinion concerns not the facts but the explanation of them. FRAZER and his colleagues—on the basis of their partition hypothesis that fatty acids of hydrolysed fat are absorbed into portal blood whereas a fine emulsion of unhydrolysed fat passes to the lymphatic system through the lacteals—explain the steatorrhœa of cœliac disease as being caused by decrease dabsorption, possibly through increased formation of mucus. The Utrecht workers, on the other hand, may still be unwilling to accept this; and although they have been careful not to criticise the partition hypothesis as the normal mechanism for absorption of fat, it has come under a certain amount of bombardment elsewhere. IVY [6] found no indication that, after ingestion, finely emulsified mineral oil appeared in the thoracic-duct lymph of dogs; and studies with C^{14}-labelled fatty acids have not yet confirmed this hypothesis.

Meanwhile, allowing the Utrecht and Birmingham schools, along with others in Madrid and the United States, to debate the mechanism of fat absorption and the metabolism of fatty acids, we can all be thankful for the new knowledge that the child with cœliac disease will show spectacular improvement if wheat or rye flour is removed from the diet. As wheat is the largest dietary source of vitamins of the B complex, and as MAY showed the value of these to the cœliac child and the Utrecht workers emphasise the importance of nicotinamide, the clinician must ensure the supply of these vitamins from other sources such as dried yeast or liver. But with this proviso, he may hope for good results from this dramatic advance

1. Sheldon, W. P. H. *Arch. Dis. Childh.* 1949, **24**, 81.
2. Sheldon, W. P. H., MacMahon, A. *Ibid.* p. 245.
3. Lowe, C. U., May, C. D. *Amer. J. Dis. Child.* 1951, **81**, 81.
4. Dicke, W. K. Cœliakie. Utrecht M.D. thesis. 1950.
5. Weijers, H. A., van de Kamer, J. H. De vetresorptie van gezonde en zieke zuigelingen en kinderen in het bijzonder van cœliakiepatiënten. Centraal Inst. v. voedingsonderzoek. T.N.O. Publication no. 113. Utrecht, 1950.
6. Berry, I. M., Ivy, A. C. *Amer. J. Physiol.* 1950, **162**, 80.

in treatment which we owe to our Dutch colleagues. And the Birmingham investigations encourage the hope of further developments.

Cancer Surveyed

IN 1935 the British Empire Cancer Campaign set up a clinical research committee to collect accurate information about the efficacy of various forms of treatment, and the proportion of cases cured by each method alone or combined. By 1938 a scheme for discovering these facts had been devised; and fifty thousand standard case-sheets, for various regions of the body, were distributed to hospitals in the County of London, all of which had agreed to send in a completed form for every case of cancer seen. Each hospital had a cancer registrar; and the Campaign appointed Lieut.-Colonel W. L. HARNETT as full-time medical secretary and registrar, charged with the task of coördinating and interpreting the data. By the end of 1938, 8480 case-sheets has been returned. On the outbreak of war, however, in September, 1939, the hospitals were dispersed out of London, the registrars joined various services, and collection of fresh cases came to an end. It might have been thought inevitable that the whole scheme should be dropped or postponed until more propitious times. But 15,200 cancer cases had by then been registered; so a small emergency committee was formed to meet regularly and to code, tabulate, and follow up these cases as far as war-time conditions allowed. During the next few years the Campaign's annual reports contained preliminary accounts of cancer of the breast and of the cervix and corpus uteri; and since then eight more have appeared. A five-year follow-up period ended in 1944. All but 400 (2·63%) of the 15,200 registered cases have been traced. A most impressive Survey of Cancer in London has now been published.[1]

The survey deals with forty-four separate anatomical sites of cancer. The data concern the number of patients, their age-distribution, hereditary factors where known, occupation, social class, relevant past history, the first symptom, the interval before first consulting a doctor and before the first special examination, the advice and treatment before admission to hospital, and the findings and treatment after admission, together with the five-year survival-rate and pathological findings. Sex-ratios are given, and the ratios of single to married and parous women. To this great wealth of valuable material a novel feature has been added. This is an actuarial estimate of duration of survival for each method of treatment. These estimates are for various reasons only approximate, but it is of great value in making decisions about treatment to be able to assess even roughly what proportion of the natural expectation of life may be hoped for as a result of different methods. The figures indicate that even with glandular and general metastases survival-time is doubled by palliative treatment either by surgery or by radiotherapy. The survey was begun before stilbœstrol came into use in this country; and, as time goes on, it will be useful to base estimates of cure on a survival-rate reckoned longer than five years after the start of treatment. The survey includes survival-times of some untreated cases, which provide a reminder for believers in secret remedies and wonder drugs that the natural progress of cancer is not uniform or necessarily continuous and rapid.

One of the many valuable features of this survey is the comparison throughout with previously collected figures, including those of the Registrar-General. This is especially necessary in comparing incidence in different social classes; a purely hospital population consists, or did in the past, mainly of classes III–V—namely, skilled, intermediate, and unskilled workers. The former occupations of a large group of people labelled retired require in future to be detailed; and a plea might be entered for more exact information about lactation in parous women with breast cancer, to determine whether this function was normal. The Registrar-General's figures have revealed quite an appreciable amount of preventable cancer, and the Campaign's registrars, who actually meet the patients, have the opportunity to disclose even more.

1. British Empire Cancer Campaign. A Survey of Cancer in London. 1952. Pp. 834. 45s. Obtainable from the Campaign, 11, Grosvenor Crescent, London, S.W.1.

Restrictions in Heart-disease

"MANY physicians appear to be too strict and particular in the rules of diet and regimen, which they deliver as proper to be observed by all who are solicitous either to preserve or recover their health. The too anxious attention to these rules hath often hurt those who are well, and added unnecessarily to the distresses of the sick." These words by HEBERDEN[1] are quoted by Dr. ROBERT LEVY at the start of a paper on Needless Restrictions Imposed on Cardiac Patients.[2]

Dr. LEVY remarks that "any person with a disorder of the heart or circulation, regardless of its cause or the degree of functional impairment, too often is looked upon as an invalid. His condition is a cause for concern. Accordingly, it is common practice to classify him as unfit to pursue his customary way of living and advise that he follow regulations which, in varying degree, restrict his activities and curtail his pleasures." He then proceeds "to consider the basis for some of these restrictions and to inquire into the reasons why physicians are so ready to impose them." Starting with tobacco, he remarks that estimation of cardiac work (with the low-frequency, critically damped ballistocardiograph) shows that tobacco causes little change in the cardiovascular system; and it rarely causes anginal pain, even in those liable to it. Nevertheless in congestive heart-failure, the acute stages of cardiac infarction, and active rheumatic fever it should be forbidden utterly, because the slightest increase in the work of the heart has to be avoided, and in peripheral vascular disease it should also be forbidden because of its constricting action on peripheral vessels.[3] Climbing stairs is another activity traditionally forbidden to patients with heart-disease; but ballistocardiographic studies[4] have shown that this does not greatly increase the work

1. Heberden, W. Commentaries on the History and Cure of Diseases. London, 1802.
2. Levy, R. L. *Circulation*, 1952, **5**, 454.
3. Levy, R. L., Mathers, J. A. L., Mueller, A., Nickerson, J. L. *J. Amer. med. Ass.* 1947, **135**, 417. Mathers, J. A. L., Patterson, M. C., Levy, R. L. *Amer. Heart J.* 1949, **37**, 612. Levy, R. L. *Med. Clin. N. Amer.* 1950, **34**, 697.
4. Mathers, J. A. L., Griffeath, H. I., Levy, R. L., Nickerson, J. L. *Circulation*, 1951, **3**, 224.

of the heart, and these patients may be allowed to take stairs leisurely, at a pace which they find agreeable; deliberate retardation, like hurry, may augment cardiac work. In the presence of congestive failure, however, or if anginal pain comes on during exertion, stairs should be avoided. As regards air travel, LEVY concludes that the vast majority of cardiac patients may undertake this without undue risk. Between 1930 and 1949 91 million passengers flew on United States air routes with only 49 in-flight deaths attributed to heart-disease, although a considerable number of cardiac patients fly from outlying districts or foreign countries to a medical centre for treatment.[5] LEVY suggests that this figure is little, if any, greater than might be found in this same group of people on the ground; and except for cases of congestive failure, active carditis, cardiac infarction with onset in the previous three months, or severe angina he does not forbid flying. What hazards there are in air travel are due not so much to the hypoxia of flight as to the excitements, delays, or discomforts incidental to flying.[6]

Of all restrictions imposed on heart patients, curtailment of normal employment or recreation is the most usual and the most disheartening. Most cardiac patients can work and in fact do so[7]; and when selectively placed in industry their attendance records have been as good as the U.S. national average for all industrial workers.[8] With the obvious exceptions (active rheumatic carditis, chronic congestive heart-failure, or intractable angina) cardiac patients are better off in health, wealth, and happiness if they are allowed to work. The same applies to exercise; and the patient himself is the best judge of what unduly strains his circulation. Those who are accustomed to exercise need not sacrifice their golf, fishing, riding, or swimming, though squash, for the majority, is too strenuous. Sir JOHN PARKINSON[9] has remarked: "Modern medical opinion allows children with congenital malformations of the heart to participate in any and every form of activity which they can undertake without distress. It does them good, not harm, and these children will not hurt themselves. Many adults might with advantage follow the same rule in regard to their handicap." WILLIAMSON[10] even suggests that in the child convalescent from rheumatic fever exercise prevents mitral stenosis.

An irksome restriction for many cardiac patients confined to bed is the use of the bedpan; and LEVY concludes that for "comfort, degree of effort and esthetic satisfaction, the commode is to be preferred." This is supported by evidence[11] that significantly more energy is expended on the bedpan than on the commode.

In recent years dietary restrictions have been increasingly in vogue for cardiovascular patients, particularly those with atherosclerosis, congestive heart-failure, and hypertensive heart-disease. The low-fat low-cholesterol diet has been recommended as a means of arresting atheromatous vascular disease, because cholesterol is found in atheromatous lesions and raised cholesterol values may be present in the serum of patients with coronary heart-disease. LEVY insists that there is no justification for enforcing this tedious diet on such flimsy evidence. Cholesterol can be synthesised from the acetate precursor in protein and carbohydrate, and moreover in many cases of atheroma the cholesterol and lipids in the serum are not raised. Low-salt diets are of proved value in congestive heart-failure, although if mercurial diuretics are also given there is some danger of hypochloræmic alkalosis or of sodium depletion. LEVY suggests that in milder cases of congestive heart-failure food may be normally seasoned in the kitchen; all that is necessary is to eschew the salt-cellar at table and to avoid bacon, haddock, and other very salty items. The use of a rigidly salt-free diet for hypertension is hardly justifiable, since the evidence for its value is unsatisfactory. Turning from treatment to diagnosis, LEVY emphasises that the electrocardiograph does not measure the capacity of the heart for work, and that if it deviates somewhat from the normal there is no need to order a programme of restricted activity and so create a cardiac invalid. He cites the case of a man who since a coronary thrombosis in 1946 has had complete auriculoventricular block, right bundle-branch block, and auricular fibrillation, and who yet has pursued an active and satisfying life as a business executive.

Why do doctors restrict patients when neither clinical nor laboratory evidence supports them? LEVY suggests four reasons. Firstly, doctors seize eagerly on any measure which sounds promising, because they are often uncritical of, or unfamiliar with, the reasons which led to its proposal. Secondly, the patient expects his régime to be modified and is disappointed if he is told to carry on exactly as before. Thirdly, the doctor "aims to protect himself from criticism. If restrictions are imposed on the patient and these are not heeded, no blame can be placed on the doctor should the course be unfavourable or should the patient die. Conversely, if improvement occurs, this is ascribed to having followed the advice given." Fourthly, a great deal of pressure is exerted by the laity, who get their ideas from daily papers and popular magazines which retail unproved theories or unreliable observations as established facts. The patient expects the doctor to subscribe to what he himself considers the latest observations. LEVY quotes BERNARD SHAW, who wrote in his preface to *The Doctor's Dilemma*: "The doctor may lay down the law despotically enough to the patient at points where the patient's mind is simply blank; but when the patient has a prejudice the doctor must either keep it in countenance or lose his patient." Under such circumstances, at the expense of additional time and effort, the physician should assume the rôle of educator.

Our function as physicians is to promote the health of those who come to us for help; in our zeal to prolong life let us not, without good cause, lessen their joy in living. Dr. LEVY's plea for more enlightened treatment of cardiac patients should remind us not only that "a little of what you fancy does you good" but that a lot of what you do not fancy does you harm.

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6. McFarland, R. A. Human Factors in Air Transport Operations. New York (in the press).
7. Kresky, B., Goldwater, L. J. *Amer. Heart J.* 1944, **27**, 623. Goldwater, L. J. *Rhode Island med. J.* 1947, **30**, 179.
8. *Circulation*, 1951, **3**, 289.
9. Parkinson, J. *Lancet*, 1951, ii, 457.
10. Williamson, B. *Brit. med. J.* 1948, i, 26.
11. Benton, J. G., Brown, H., Rusk, H. A. *J. Amer. med. Ass.* 1950, **144**, 1443. Annotation, *Lancet*, 1950, i, 551.

Annotations

THE SEARCH FOR VIRICIDES

SOME of the larger viruses, such as the psittacosis-lymphogranuloma group, are susceptible to chloramphenicol and other antibiotics, but there is no solid evidence that any drug is effective against the smaller viruses which attack man. Many compounds have been tested on experimental virus infections in the chick embryo, but the results do not always tell us how they will act in patients. Eaton and his colleagues [1] at Harvard have demonstrated that the aromatic diamidines will inhibit virus growth in the chick embryo. Pentamidine had some in-vitro viricidal effect on feline pneumonitis and meningopneumonitis but no action on influenza and mumps viruses. Stilbamidine had a selective effect on mumps virus in the allantoic sac, which suggests that the drug does not act simply in virtue of its toxicity to tissues in general. Tissue-culture experiments with mumps and influenza viruses have led the Harvard workers [2] to believe that the diamidines act directly on intracellular virus or set up a chemical blockade which affects a tissue component essential for virus synthesis.

In Sweden, Fischer [3] has been investigating the antiviral activity of extracts of various fruits and vegetables, including bilberry, red and black currant, horse-chestnut, spinach, onion, carrot, and potato, against one of the *Bact. coli* bacteriophages. The most potent of the extracts tested was one derived from maple fruit. This completely and rapidly destroyed the bacteriophage and, in certain dilutions, selectively destroyed the phage leaving the bacterium apparently undamaged. The active substance is insoluble in alcohol, ether, or acetone but soluble in water; it can be filtered and heated to 120°C for 10 minutes without loss of potency. Fischer is already testing it against the Lansing strain of poliomyelitis virus, and we clearly need more information about its effect on bacteriophage.

Some of the structural analogues of the purine and pyrimidine constituents of nucleic acid inhibit the multiplication of vaccinia virus in chick-embryo tissue. In the U.S.A., Thompson and colleagues [4] have investigated a series of 5-phenoxythiouracils and related compounds and find that they have little in-vitro activity but can be shown to have a definite protective effect in vivo if treatment is begun soon after infection. The treated animals have a lower titre of virus in their tissues than the controls, suggesting that these substances directly or indirectly retard virus multiplication but are not true viricides. The most effective of the 5-phenoxythiouracils has no antithyroid or antibacterial action at concentrations which inhibit the growth of vaccinia virus, nor does it affect other viruses. Groupé and colleagues [5] are searching for antiviral substances among the products of the actinomycetes, already a prolific source of antibiotics against bacteria. Of 113 culture filtrates tested against the viruses of Newcastle disease and influenza, 8 prolonged the life of infected embryos by 24 hours or more, and 3 prevented the death of more than half of the inoculated eggs. A strain of *Streptomyces lavendulæ* not producing streptothricin has yielded a substance named 'Ehrlichin,' which inhibits influenza viruses A and B and the Newcastle disease virus if it is allowed to act for 2–3 hours before the eggs are inoculated. Ehrlichin had a definite inhibitory effect in vivo only on influenza-B infections, and its suppressive effect on the formation of viral hæmagglutinin was reduced when it was injected before, instead of after, infection of the eggs. Ehrlichin is a crude substance, and the solutions used may contain more than one antiviral agent; but there is no doubt about its activity against some viruses. In-vitro serum destroys its activity, but nevertheless it slightly reduces the pulmonary consolidation produced by virus infections in mice. Against representative species of bacteria, fungi, the pox group of viruses, and bacteriophage ehrlichin is completely inactive.

These diverse studies are not of much immediate practical importance, but they show that the viruses have chinks in their armour and each chink is being energetically explored.

1. Eaton, M. D., Levenson, C. G., Perry, M. *J. Immunol.* 1952, **68**, 1.
2. Eaton, M. D., Perry, M. E., Levinson, C. G., Gocke, I. M. *Ibid*, p. 321.
3. Fischer, G. *Ann. Inst. Pasteur*, 1952, **82**, 119.
4. Thompson, R. L., Price, M., Minton, S. A., Falco, E. A., Hitchings, G. H. *J. Immunol.* 1951, **67**, 483.
5. Groupé, V., Frankel, J. W., Lechavalier, M., Waksman, S. A. *Ibid*, p. 471.

COÖRDINATION OF THE HEALTH SERVICE

IMPRESSED by the need for closer integration in the National Health Service, the Central Health Services Council set up a committee, under the chairmanship of Mr. F. Messer, M.P., to study how this might be achieved; and the committee has now reported.[1]

The report remarks that the problem is especially difficult for three reasons. In the first place, two of the three main branches of the service—namely, the hospital and general-practitioner services—have not in themselves a unitary structure. Secondly, two of the branches are associated with authorities which are not created by the Act but which are closely concerned with its operation: in the hospital service both boards of governors and regional boards have a special relation to the universities, while the local health authority services are closely related to county and county-borough councils. Thirdly, there is the difficulty of numbers and geography; the geographical pattern is so complex that one authority must find it hard to be conscious of its "opposite number." Yet it would be wrong to conclude that the structure of the service is wholly to blame for the failure of the various authorities to coöperate more effectively; the need for coördination has been emphasised but not created by the National Health Service; and it is unreasonable to expect perfect coördination in so vast a concern.

"Over half a million people are engaged in the Service. It is the third largest concern in the country. Many organisations which have a much more unitary structure and a more strictly utilitarian purpose have suffered from their own severe problems of internal organisation and have had to examine in the same way the relative advantages of geographical and departmental devolution. All concerns which surpass the grasp of one individual reveal difficulties of internal coördination and integration. The central planning staff can do a certain amount but the greater the delegation to the periphery, the greater the problem of maintaining internal cohesion."

With this reservation the committee states flatly that it is dissatisfied with present arrangements for coöperation; and it describes in detail the various ways in which the need is not being met. Turning to remedies, the report finds no hope of substantial improvement from extension of "interlocking" membership, exchange of papers, ad-hoc Ministry circulars on particular problems, ad-hoc coöperation between officers, ad-hoc meetings, or standing joint committees on special subjects. With each of these rejected in turn, the committee came, by elimination, to the solution of standing joint consultative committees; and it has given thought to the constitution of such bodies. Logic, it declares, would demand the creation of a regional committee midway between the national advisory machinery and committees at local level. Yet only the hospital service has any regional authority; and a regional committee, if it were to be fully representative, would be unwieldy, while if

1. Central Health Services Council: Report on Coöperation between Hospital, Local Authority, and General Practitioner Services. H.M. Stationery Office. Pp. 34. 1s. 6d.

its size were kept within reasonable bounds direct representation would be denied to some authorities. The committee therefore concentrated its attention on coördination at the level of the local health authority, executive council, or hospital management committee. Here again it found itself in difficulties over the definition of areas; for the catchment areas of hospital management committees are seldom coterminous with the area of the local health authority and executive council. In the end the committee concluded that:

(*a*) The county borough or other large town should usually be the centre on which a committee is based.

(*b*) Since the county population almost always makes extensive use of hospital services within the county borough, both the county and the county borough and the two executive councils should be represented on the one committee.

(*c*) A combination of hospital management committee catchment areas or of areas of county-council divisional health areas with the county boroughs they adjoin will usually prove the most satisfactory arrangement, but wherever possible a local health authority boundary should be used (this will only be a county-borough boundary in the larger cities).

In these "local health service areas" membership of the "joint health consultative committees" might be drawn one-third from the hospital management committee(s) providing general hospital services, one-third from the executive council(s) and the local medical committee, and one-third from the county and/or county borough concerned. The functions of these committees would be: (1) to discuss local arrangements of mutual concern; and (2) to receive early information of major developments and to suggest modifications thought desirable. The local health service areas might be decided by regional conferences, to be convened by regional hospital boards; and "some of us consider that the regional conference, having once met, may prove too useful to be allowed to disappear altogether."

The committee frankly owns that "we are well aware of the danger . . . of creating another series of committees in a Service in which no one wants more of them"; but it rightly goes on to say that the problem of coördination can no longer be allowed to drift, "only to be tackled in places and at times where personalities permit and where pressing questions demand." It foresees that the proposed new committees can be fashioned after no single pattern; and the task of the regional conferences is likely to be far from easy.

SKIN REACTIONS TO ADHESIVE DRESSINGS

THE ever-increasing diversity of adhesive bandages, plasters, and dressings provides a range which, from cosmetic and æsthetic aspects, should satisfy all tastes. Nowadays dressings, in workaday buff or white or flesh tints, are second only to cosmetics in their spectral range. They are made rigid or elastic with one-way or two-way stretch, ensuring adherence and conformity to all but the most awkward of anatomical contours. The exposed surface may, like a photographic print, be matt or glossy, and the corners may be as rectangular as a football field or as delicately curved as a race-track.

Less attention seems to have been paid to making sure that these devices shall not upset the skin. Skin reactions are not only a nuisance but may cause considerable suffering and invalidity from spreading sensitisation. There is still no satisfactory answer to the question: What is the best kind of adhesive to apply to sensitive skin? When the application of an adhesive dressing has to be continued for a long time, as with extension plasters, or indefinitely, as in treating hypostatic ulcers or affixing a Koenig-Rutzen or "disposable plastic" ileocolostomy bag, the onset of soreness is generally taken as an indication for discontinuing adhesive bandages or dressings, at least for a time. In such cases, some irritating or sensitising property of the adhesive is usually blamed; but common causes of trouble are interference with sweat evaporation by impermeable adhesive materials, and sweat retention within the epidermis owing to the blockage of sweat-duct ostia by keratotic material produced by the stimulating effect of the adhesive material on the epidermis. Interference with evaporation of sweat causes the skin to become white and sodden; and wounds under such dressings become moist, lose their sealing scab, gape, and heal slowly. Keratotic plugging of the ostia leads to the escape of sweat under pressure from the sweat-ducts into the epidermis. This causes disruption of the epidermal cells, an inflammatory reaction, and itchy red papulation similar to miliaria rubra (prickly heat).

Peck et al.[1] conclude that three types of reaction may follow application of adhesive tape: a fleeting reaction from the trauma of removal, a reaction of irritation, or a reaction of eczematous sensitisation. The relatively unimportant reaction of traumatic removal occurs particularly when the adhesive is tacky, and it can be minimised by careful removal and by the use of solvents. The reaction of irritation, which is the commonest type, occurs only after five days or longer; and the histological changes are very similar to those of miliaria rubra—namely, plugging of the sweat-duct orifices with keratin and some generalised hyperkeratosis, affecting even the sebaceous follicles. O'Brien[2] thinks that closure of the sweat-pores in prickly heat is due to several factors, including staphylococcal infection, the use of fat solvents, sebaceous deficiency, and possibly œdema of the stratum corneum. Shelley et al.[3] believe that minor epidermal injury from chemical or physical causes contributes to the production of miliaria rubra. Thus adhesive tape or even the maceration from sweat itself may produce hyperkeratosis and plugging. It takes three days for the keratin plugs to form within the sweat-duct orifices. This seems consistent with Peck's observation that the reaction of irritation takes five days or more to develop; but Peck et al. believe that keratin stimulation with a miliaria-like effect cannot alone account for the reaction of irritation. They think that other factors are bacterial multiplication under the plaster in conditions of maceration and alteration of pH towards alkalinity. The third type of reaction—sensitisation to the adhesive—is rare. The histological changes are identical with those of allergic contact dermatitis. Peck et al. obtained from three manufacturers of adhesive dressings data on no less than 28 ingredients of adhesive plasters; and they found negative patch tests to each single ingredient in people who had previously proved hypersensitive to the adhesive plaster. They suggest that this seeming anomaly was due either to batch variations or to the presence in the completed plaster of chemical compounds differing in their sensitising potentialities from those of the several ingredients.

Schilling et al.[4] have carried out controlled clinical trials with micro-porous 'Nylon' film dressings in the treatment of minor wounds. Such dressings provide an effective barrier against micro-organisms but are sufficiently permeable to water vapour to prevent the skin from becoming sodden. They found that the average healing-time for 19 clean wounds treated with nylon dressings was 6·26 days, and for 18 clean wounds dressed with the usual waterproof dressings 9·06 days. In oil-contaminated wounds the times were 5·87 days in 31 cases treated with nylon dressings, and 8·07 days in 30

1. Peck, S. M., Michelfelder, T. J., Palitz, L. L. *Arch. Derm. Syph., Chicago*, 1951, **63**, 289.
2. O'Brien, J. P. *Brit. J. Derm.* 1947, **59**, 125; *J. invest. Derm.* 1950, **15**, 95.
3. Shelley, W. B., Widman, F. D., Pillsbury, D. M. *J. invest. Derm.* 1948, **11**, 275. Shelley, W. B., Horvath, P. N. *Ibid*, 1950, **14**, 9, 193. Shelley, W. B. *Ibid*, 1951, **16**, 53.
4. Schilling, R. S. F., Roberts, M., Goodman, N. *Lancet*, 1950, i, 293.

cases treated with waterproof dressings. The seal was maintained in 78% of 121 nylon dressings, but in only 40% of 92 waterproof dressings because of the tendency to replace this type periodically in an attempt to minimise maceration.

The aim of manufacturers, then, must be to provide adhesive dressings which permit sweat evaporation yet prevent contamination by bacteria, which cause little epidermal keratinisation, and which have a low potential of eczematous sensitisation. It is gratifying to know that leading firms are working on these lines with perforated elastic materials, porous spreading of adhesives, and micro-porous coverings. It has been suggested that an antiseptic should be incorporated in the adhesive for sweat-retaining dressings, as a means of inhibiting bacterial flora. In practice, however, this might lead to an increased incidence of eczematous sensitisation. The problem is by no means easy. It may be that an adhesive, because of its sticky properties, must inevitably have some keratin-stimulating effect.

ACETYLCHOLINE IN ANXIETY STATES

THE principle of "sympathetic blockade" in the treatment of states of anxiety was suggested by the work of Cannon,[1] who found that the tachycardia, raised blood-pressure, increased sweating, and mobilisation of liver glycogen in some emotional states were due to overactivity of the sympathetic nervous system. This work has directed attention to the therapeutic possibilities of acetylcholine; and its administration in cases of schizophrenia[2] and the anxiety states[3] was described at the International Congress of Psychiatry in Paris in 1950.

At a meeting of the psychiatric section of the Royal Society of Medicine on April 8, Prof. J. J. López-Ibor, of Madrid, said that he regards recurrent anxiety states as part of the phasic group of mental disorders described by Kraepelin. The anxiety in these cases he believes to be neither psychogenic nor reactive, but "vital"—that is biological in origin—and he suggests that the phasic course is controlled by the diencephalon. To the various forms of anxiety state that constitute this group he gives the name of "timopathic disorders," as they are all characterised by a feeling of restlessness, dread, and apprehension—a feeling that something terrible is going to happen—which the patient refers to dangers arising within himself. Primary symptoms include cardiac dysfunction and dizziness, and there is a tendency for anxiety to be transferred to new symptoms arising in the course of the illness. The "timopathic" disorders include manic-depressive psychosis of the type in which the patient is anxious and inhibited; pure "anxiety timopathy" with "vital" anxiety; states of chronic fatigue due to nervous tension; and organic or visceral neuroses with a phasic course. López-Ibor holds that these are all "vital" or somatic in origin, and that thus they are amenable to pharmacological treatment but unresponsive to psychotherapy; but he grants psychotherapy a preventive and supportive rôle, and thinks that it may help to prevent these conditions becoming fixed and chronic. Electroconvulsive therapy he does not think suitable for the "timopathic disorders"; for the severity of the treatment is out of proportion to that of the illness, and anxiety over the convulsion and loss of consciousness is especially severe in these patients, who dread, above all, the dissolution of their personality. A freshly prepared solution of acetylcholine bromide 0·2 g. in distilled water is given intravenously, the injection taking 30–60 seconds. It is given with the patient fasting, either in the morning or in the evening, and produces fall of blood-pressure and slowing or momentary arrest of the heart. The reaction is severe, but in several hundred cases he has met with no fatality. A five-year follow-up shows cure or pronounced improvement in over 60% of cases. Patients of pyknic or athletic build do better than asthenics, and acute cases better than chronic; in obsessionals or patients with organic neuroses overt anxiety is a favourable prognostic sign. Due care must be taken in the selection of cases, both from a mental and physical standpoint.

Opening the discussion, Dr. William Sargant described work with acetylcholine bromide that has been initiated at St. Thomas's Hospital, London. He has not found that it benefits the hysteric, except at first by its suggestive effects; nor does it help patients with panic reactions who have an immature personality and an asthenic physique. He thinks that its chief value is in the treatment of mildly obsessional patients with severe tension states who do not respond to E.C.T. The best results, in his experience, are obtained in people of pyknic or athletic build whose anxiety is obsessional or confined to one topic. It also relieves headache or other pains associated with tension, and thought-disorder with tension—for example, inability to concentrate because of obsessional thoughts. It is now being given to out-patients in three or four treatments a week, with reduction of this number after ten or twelve weeks; and he finds that some patients are helped after the course of injections by an occasional maintenance dose. Dr. Sargant said that he wanted to investigate the treatment in order to discover the best methods of selecting cases; for to use new methods of therapy in psychiatry as a sort of universal panacea only led to their eventual discredit.

That states of chronic anxiety with tension are a real therapeutic problem to psychiatrists of all persuasions was shown by the large audience and the lively discussion. Acetylcholine therapy has a claim to serious consideration as a method of affording somatic relief to some patients; but a combined approach from the psychogenic and biological standpoints remains no less desirable than ever.

HEPATIC COMA

MENTAL and neurological changes, culminating in coma and death, have been recognised since ancient times as occasional features of liver disease. The widespread epidemics of infective hepatitis during the past few years have provided an opportunity for studying the relation between the central nervous system and the liver; and Walshe,[1] who has investigated 18 cases, gives an excellent picture of the disturbances. Except for coma, no single feature was common to all his cases. Definite personality changes, though they can be quite dramatic, are rare; but a short period of confusion and disorientation usually precedes loss of consciousness. The comatose patient commonly lies in a characteristic attitude, with legs crossed and hips fully flexed. Apart from dilatation of the pupils and hippus, cranial nerve disorders are rare. Symptoms of pyramidal and extrapyramidal disturbances, however, are quite common; the former include spasticity, increased knee-jerks, ankle-clonus, and extensor plantar responses, and the latter choreiform movements and athetoid postures in children and "lead-pipe" and "cogwheel" rigidity in adults; twitchings and increased myotatic irritability were present in 5 cases, but convulsions did not occur.

At necropsy the demonstrable anatomical damage to the brain is usually negligible—œdema and some perivascular hæmorrhage are the most usual findings—and this agrees with the clinical observation that patients who survive may recover completely. The disturbance

1. Cannon, W. B. Bodily Changes in Pain, Hunger, Fear and Rage. New York, 1935.
2. Flamberti, A. M. *Congr. int. Psychiat. Paris*, 1950 part 4, p. 59.
3. López-Ibor, J. J. *Ibid*, p. 85.

1. Walshe, J. M. *Quart. J. Med.* 1951, **20**, 421.

is apparently biochemical, though its character is uncertain. Hypoglycæmia might be expected to have an important rôle in determining the clinical picture of advanced hepatic necrosis. A very little surviving liver, however, can maintain a normal blood-sugar level, and in most cases of hepatic coma the blood-sugar is in the normal range. Since the liver plays an important part in detoxication, hepatic coma has sometimes been ascribed to inadequate detoxication of toxins absorbed from the small intestine. As Walshe rightly points out, however, on such a basis all patients with a portacaval shunt should pass into coma. A more attractive hypothesis, put forward by Labby,[2] is based on the fall in the serum-cholinesterase level in parenchymal liver disease. This fall, if sufficiently pronounced, could lead to accumulation of acetylcholine, which might well result in severe cerebral disturbance. On the other hand, complete destruction of serum-cholinesterase by di-isopropyl fluorophosphonate does not precipitate cerebral symptoms in cases of hepatitis, nor does raising the serum level to normal by appropriate transfusion alleviate the symptoms when present. Paper chromatography has opened the way to more detailed study of the disturbance of amino-acid metabolism in hepatic disorders. In mild cases the amino-acid pattern in body-fluids may be strikingly abnormal, even though the level of total amino-acids is normal. In more severe cases there is a pronounced increase of many of the amino-acids in the urine, plasma, and cerebrospinal fluid (C.S.F.). In a study of 15 patients in hepatic coma, Walshe found gross amino-aciduria in 8, a similar but less pronounced state in 3, and an abnormal pattern affecting principally cystine, β-amino-isobutyric acid, and γ-aminobutyric acid in 4. Plasma was examined in 5 of these cases, and C.S.F. in 3: an increased concentration and abnormal pattern of amino-acids was found in all. In the C.S.F. the most striking abnormality was an excess of glutamine. This is normally the dominant amino-acid, but in comatose patients it was not only absolutely but also relatively increased. In 2 of these fluids glutamic acid was also present.

From these findings Walshe tentatively concludes that hepatic coma results from the toxic action of amino-acids, and that the cause is inability of the injured liver to maintain the normal amino-acid balance in the plasma. The evidence for this, however, is circumstantial. Glutamine and glutamic acid are the most important of the amino-acids for cerebral metabolism,[3] but it is difficult to understand why a moderate increase of their concentration in plasma and C.S.F. should so profoundly disturb cerebral functions. Is it not at least as probable that the disturbed cerebral function accounts for the increase of these amino-acids in the C.S.F.? The pattern of the amino-acids in the C.S.F. in other forms of coma might help to settle this question; and it would be interesting to know whether coma can be produced experimentally by intravenous or intracarotid injections of these acids. The finding by Amatuzio and Nesbitt[4] of a raised blood-pyruvate in hepatic coma led them to postulate some interference in carbohydrate metabolism—possibly faulty incorporation of pyruvic acid into the Krebs cycle. The rise in pyruvate is, however, not alone responsible for the coma, since similar increases take place in many non-comatose states. If this rise in hepatic coma merely indicates disturbed hepatic carbohydrate metabolism, it throws no real light on the relation of the cerebral disturbance to that of the liver. If, on the other hand, the raised blood-pyruvate is due to impaired cerebral metabolism, how is this related to the hepatic disturbance?

The solution to the problem of this cerebral-hepatic relationship will not be found simply by demonstrating an abnormal metabolite in the plasma or C.S.F. Only when such a metabolite can be shown to result from the disturbed hepatic function, and to produce coma when introduced in similar concentration in animals and man, can the problem be regarded as solved. The further possibility that the cerebral disturbance may be due to the lack of an essential metabolite normally provided by the liver should not be overlooked.

2. Labby, D. Conference on Liver Injury: Transactions of the 5th meeting. New York, 1946; p. 120.
3. Weil-Malherbe, H. *Biochem. J.* 1936, **30**, 665.
4. Amatuzio, D., Nesbitt, S. *J. clin. Invest.* 1950, **29**, 1486.

TEACHING EVOLUTION IN THE SCHOOLS

As doctors we have been so long familiar with the theory of evolution, and use it so constantly in our day-to-day thoughts on the nature of the human body, that it is hard to realise that most young people still leave school without having heard it expounded. This is surely a handicap which could be remedied; and Prof. Julian Huxley, F.R.S., in an occasional paper,[1] puts the case strongly for teaching the principles of evolution adequately to children, so that they become a useful tool for them—an invisible framework, to use his own phrase.

Every generation in turn asks: "What are we? What sort of world do we inhabit? And in what sort of relation do we stand to that world?" The answers, in our present state of culture and with our existing mental equipment, must inevitably be partial and incomplete; but they can hardly be formulated at all, Professor Huxley insists, without some understanding of evolution as it appears throughout the universe—whether inorganic and cosmological, organic and biological, or human and social.

The first of these phases, he says,

> "concerns the transformation of lifeless matter and energy—the physical universe as a whole, the island universes within the universe, the stars within the island universes, the occasional planetary systems among the stars. The second concerns the transformations of living organisms, from bacteria and protozoa to social insects and warm-blooded vertebrates. And the third concerns the transformations of self-conscious or experience-transmitting societies, from those of submen and savages to the Renaissance and modern industrialism."

The first phase is the most extensive and the slowest; the second, which moves faster, is restricted to this planet and possibly a few others; the third is restricted, as far as we know, to one among the million or more types of organism on this planet, and is moving at an increasing rate. The basic method of the first phase is simple physical aggregation and interaction, with occasional chemical reactions added; that of the second is natural selection, with transmission of experience as an occasional subsidiary method; while that of the third is the cumulative transmission of experience alone. The results of the first phase are huge but relatively simple systems, with little variety; the results of the second, and even more those of the third, are immensely various and complex.

It is the second phase—the organic, biological phase—which on analysis supplies so much that is relevant to our general thinking. As a subject of study it has required the use of every type of scientific method—observational, experimental, quantitative, historical, theoretical. Furthermore it exemplifies the way in which scientific advance is made: the flash of intuition, the formulation of a theory, and its patient testing by the slow process of amassing evidence. Evolution is valuable in education, Professor Huxley thinks, because it provides a transition from physicochemical science to the humanities, because it throws light on man's place and destiny in Nature, and because it links the material and the mental. It shows the universal power of living things to adapt, the great variety of life, the trends towards improvement (most of them coming sooner or later to a stop), and the succession of one dominant type to another. Work done during the

1. Evolution and Education. No. 6, published by the British Social Biology Council. 1951. Pp. 16. 1s.

last thirty years suggests that all these aspects of life are the result of a single basic property of living matter: its not-quite-perfect capacity for self-copying. The genes of the hereditary constitution, if they were fixed (and they are nearly fixed), could produce permutations indefinitely, but nothing original. As it is, the copy is occasionally not identical with the original: a gene mutates, and the mutation confers some degree of advantage or disadvantage on its possessor. The effects are differential survival and differential multiplication, and hence every kind of evolutionary change.

Threading the maze of their opportunities, organisms often take an evolutionary turning which can bring them only to a dead end of development. Thus—fortunately for us—insects and land arthropods breathe by air tubes, more efficient than lungs if the size of the organism is small but becoming rapidly less efficient as size increases. A spider the size of a mouse is feasible, but one the size of a rat is out of the question. By limiting their total size insects have also limited the size of their brains. Their evolution has thus presented problems in engineering which should fascinate the young. As long as man remains in existence, no other group can hope to oust him from his position of dominance; for as soon as he recognised the threatened change he would use his superior brain to counter it.

These ideas should be part of a child's grounding in science, because they will help him to unify and integrate what he is taught. In schools, at present, human physiology is seldom related to comparative physiology or to evolution; and natural history deals only with the contemporary scene, not with the evolutionary history of plants and animals. Our policy, Professor Huxley says, should be clear: to insist that biological subjects should rank equally with physicochemical subjects in the school science curriculum, and that they should be treated whenever possible from the evolutionary angle.

NERVOUS CONTROL OF SWEATING

Kuno's work [1] has shown that there are two main types of sweating: thermal, and mental or emotional. Thermal sweating occurs in response to heating of the body and is greatest on the forehead, dorsum of the hand, and chest and neck. Mental sweating is greatest on the palms and soles, but also occurs in the axilla and on the forehead. Both types are controlled by the central nervous system, thermal sweating from the temperature-regulating centre in the anterior portion of the hypothalamus, and mental sweating from centres at different levels up to the cerebral cortex. The nerve-fibres supplying sweat-glands are distributed via the sympathetic ganglia; and the final distribution of the postganglionic fibres is mediated by the sensory nerves to the skin.[2] Thus, anatomically the nerve-fibres to sweat-glands are sympathetic; but functionally they behave as if they belonged to the parasympathetic system. For example, the activity of sweat-glands is stimulated by acetylcholine and pilocarpine, and inhibited by atropine; and Dale and Feldberg [3] have explained this anomaly by showing that the nerve-fibres which excite the sweat-glands are cholinergic (i.e., they liberate acetylcholine as chemical transmitter), whereas nearly all other sympathetic nerve-fibres are adrenergic (i.e., they liberate adrenaline, and noradrenaline, as transmitter).

Chalmers and Keele [4] have recently tried to find out whether the facts known about chemical transmission to sweat-glands could help explain the excessive secretion in hyperidrosis. They reasoned that the sweat-glands of the palms and soles might be hypersensitive to acetylcholine, in the same way that the digital arteries and the arteries of the palmar arch are hypersensitive to cold in Raynaud's syndrome.[5] In hyperidrotic patients they measured the sensitivity of the affected sweat-glands by recording the responses to different concentrations of acetylcholine injected locally; sweat secretion was measured by the iodine-starch paper method of Randall.[6] In order to test the response of the palmar sweat-glands it was necessary first to anæsthetise the median nerve at the wrist with procaine. Chalmers and Keele found that there was no significant difference in the sensitivity of the palmar sweat-glands to acetylcholine between 8 normal people and 6 with hyperidrosis; so they conclude that the excessive secretion of sweat in this condition is not due to hypersensitivity of the sweat-glands to the chemical transmitter. They found no evidence that cholinesterase activity was reduced; so the excessive sweating of hyperidrosis must be due to increased release of acetylcholine at the postganglionic nerve-endings. This increased release is most probably due to increased central nervous activity; and it is interesting that in some patients with essential hyperidrosis there is also peripheral vasoconstriction, probably central in origin but mediated via an adrenergic nerve pathway.

Chalmers and Keele [7] have also investigated the possibility that the nerve-supply to some sweat-glands might be adrenergic in man. They confirmed the findings of Haimovici [8] and Sonnenschein et al.[9] that in man sweat-glands (in forearm and palm) secrete in response to locally injected adrenaline and noradrenaline. They showed, however, that the introduction locally of adrenaline antagonists such as tolazoline ('Priscol') did not inhibit thermal or mental sweating, even when these were applied in high enough concentrations to abolish the response to injected adrenaline. Local application of atropine always abolished sweating in both forearm and palm. In this connection Shelley [10] has found that the apocrine sweat-glands of the axilla (the other glands in the forearm and palm are termed eccrine) are stimulated by adrenaline and noradrenaline and not by acetylcholine, and that their physiological activity is inhibited by adrenaline antagonists and not by atropine. This work suggests that the nerve-supply to apocrine sweat-glands in man is adrenergic in nature.

The excessive sweating of essential hyperidrosis can be controlled by atropine, which blocks the action of acetylcholine; but the doses required also inhibit salivary secretion, and may cause some disturbance of accommodation. Grimson et al.[11] have tried another acetylcholine inhibitor—β-diethylaminoethyl-xanthine-9-carboxylate methobromide ('Banthine') in the treatment of hyperidrosis, but it does not appear to be much superior to atropine. Chalmers and Keele [4] have tested the ganglion-blocking agents, pentamethonium and hexamethonium bromide, in 6 patients with essential hyperidrosis. The average dose was 250 mg. thrice daily by mouth, and in 4 of the patients the symptom was satisfactorily controlled by these drugs. Paton and Zaimis [12] have shown that these methonium compounds block transmission through autonomic ganglia by rendering the ganglion cells insensitive to the acetylcholine liberated at the preganglionic nerve-endings. Finally, where hyperidrosis arises in the apocrine glands of the axilla—and if the nerve-supply to these glands is truly adrenergic—secretion might be inhibited by such drugs as tolazoline, dihydroergotamine, and dihydroergocornine.

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Special Articles

A RECOVERY WARD
ITS PLANNING AND USE

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THOUGH some hospitals in this country have wards set aside for patients recovering from operation, little seems to have been written on their scope, situation, or design. The American literature is fuller, but still small considering that the recovery ward, in some form or other, appears to be more widely used in the United States.

In 1942 a postanæsthesia room was opened in St. Mary's Hospital, Rochester, Minnesota. One bed was available for each operating-room, and the department was open from 9 A.M. to 5 P.M. Patients were never returned to their own bed until they were awake, and both male and female patients were accommodated in the same room. The number of patients admitted to the P.A.R. rose from 2071 in 1942 to 3427 in 1945 (Mayo Clinic 1945, 1948).

In 1948 the room was staffed with two graduate nurses and one orderly. Each bed was arranged so that it could be seen from any part of the room. The patient was placed with his head towards the foot of the bed. The length of stay of the patient in the P.A.R. was about the same as his stay in the operating-room. During the critical postanæsthesia period one nurse did the work which usually requires the services of three nurses (McQuillen 1948).

Similar facilities were introduced in three hospitals in Rochester, and in 1949–50 16,985 patients passed through these rooms. Further extensions to this service were under way in 1951 (Mayo Clinic 1951).

The Anæsthesia Commission of the Philadelphia County Medical Society observed many errors in resuscitation, "foremost among these being inefficient methods of maintaining respiratory function when it was depressed or paralysed. Inadequate nursing care coupled with respiratory obstruction in the postoperative period occurred in 95 cases" from a total of 307 fatal cases. The commission said that "the need for post-operative observation rooms under trained personnel and under the direction of the anesthesia service was obvious," and thought that "there should be more post-operative anesthesia recovery rooms, where care can be given the patient immediately after anesthesia. We find that there is a considerable incidence of respiratory obstruction in the immediate post-operative period" (Ruth et al. 1947).

In 1948 Noble described a small unit of 5 beds in two rooms, on the same floor as the operating-theatres. During four months 277 patients, or 60% of all surgical cases, passed through this unit. Of this number, despite routine post-anæsthetic care, "which undoubtedly prevented considerable trouble, approximately 8% had complicating episodes during recovery" (Noble 1948).

A report on 35,000 recovery-room cases handled in the previous seven years by a single group of anæsthetists working in two hospitals in the District of Columbia says that "since the advent of the recovery room in these hospitals such serious complications [as respiratory obstruction] have been prevented in all cases in which the recovery room was utilised. Unavoidable sequelæ to anæsthesia such as respiratory depression or circulatory depression, when they have occurred, have been detected sooner and more properly managed" (Lowenthal and Russell 1951).

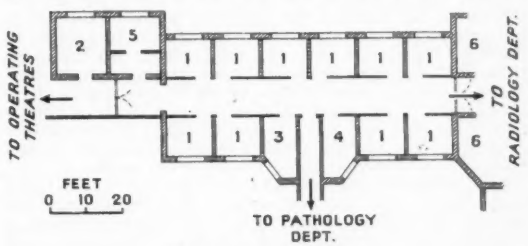
Anderson (1951) includes in his discussion of the supervised emergence of the anæsthetised patient plans and diagrams of suggested structural lay-outs. All allow for only a limited number of beds.

A BRITISH RECOVERY WARD

At the Plastic Surgery and Jaw Injury Centre, Queen Victoria Hospital, East Grinstead, before February, 1946, the recently anæsthetised patient was returned to his own bed. This practice gave rise to a number of incidents, and there had been two deaths. The local geography gave rise to difficulties, for the single-storey hutted wards were at some distance from the operating-theatres: indeed the distance between bed and operating-table was in one case over 400 yards. Each ward was equipped with oxygen under pressure, a suction apparatus and a carefully planned resuscitation tray carrying injection materials and drugs, endotracheal tubes, gag, tongue clips, tongue spatulæ, sponge-holders, box-wood wedges, and airways of various types. Nevertheless, incidents occurred, especially in patients undergoing extensive facial repairs.

Through the generosity of the British American War Relief Fund, plans had been made since 1944 for a new surgical centre. This, however, would further increase the distance between bed and operating-table, and the anæsthetic staff of the unit urged the inclusion of a recovery ward in the new scheme. This was agreed on the basis of 10 single-bed rooms attached directly to the operating suite (see figure). (The operative turnover at that time was 1720 per year and steadily rising.)

In close relationship to this ward was the pathological laboratory with its blood bank, the X-ray department, and the dispensary. Each room of the ward had an outer wall and an inner glassed wall, which adjoined a central corridor (see figure). At the centre of one side of this central corridor were a



Plan of the recovery ward

1. Recovery rooms	4. Kitchen
2. Linen room	5. Sluice room
3. Dressing-room	6. Dispensary

kitchen, a dressing-room equipped with sterilisers, and storage space for all resuscitative drugs and equipment. Also included in the plan was a sluice-room and a large linen-storage room, to accommodate the large stocks of bed-linen required to care for a rapid bed turnover.

Each room was fitted with a wash-basin and a fixed unit giving piped oxygen with built-in flow-meter, piped suction, bell, and various electrical tappings for bedside lamps, electric blankets, &c. The 10 beds in the department were equipped with 'Sorbo' mattresses and large castors, 2 being of the Lawson Tait variety. Doors, both of the rooms and of the corridor, were wide enough to allow a bed to pass through easily. In an emergency each room could, for a short period, take 2 hospital beds or 3 cots.

The ward was placed in the general charge of the anæsthetic department, and at no time has any surgeon, without prior consultation, had the use of a bed other than for the recovering patient. Our surgical colleagues have helped us enormously in our task by the restraint of their requests.

During the operating sessions the sister in charge of the ward pays frequent visits to the adjoining operating suite to discuss the management of the cases with the surgeon and anæsthetists. If any patient is transferred directly from operating-table to bed in the theatre, the sister is present. The rest of the staffing was at first frankly experimental. Originally in addition to the sister-in-charge there were two trained staff-nurses and one assistant nurse. This staff has grown, and now, besides the sister-in-charge, the day staff consists of four State-registered nurses, and two male orderlies.* The

* It is interesting to note that the Whitley Council has rejected a request by the hospital authorities for recognition of the sister-in-charge as a departmental sister.

night staff consists of a State-registered nurse and an assistant nurse. If more staff is needed in an emergency, nurses have always been provided.

The following equipment was supplied to the ward:

Electric blankets for bed-warming; all necessary equipment for transfusion, infusion, and all types of intravenous and other injections; oxygen administration equipment (the B.L.B. mask or a variant is almost universally used); suction catheters in various sizes; tongue clips, gags, oral props, sponge-holders, and endotracheal and short nasal tubes. For special types of surgery there is special equipment—e.g., a pair of wire-cutters is at the bedside of every case of fractured jaw returning from the operating-theatre with the jaws wired together. After recovering consciousness these patients will require special feeding-cups. Children after operation for cleft lip or palate should have the arms splinted for some hours. Patients who have had impacted wisdom teeth removed will have ice-packs applied continuously for six hours.

All these and other special treatments require their own equipment, which now need not be available in every ward in the hospital, but only in the recovery ward. So here emerges one of the advantages of such a ward—over-all economy of equipment.

HOW THE WARD IS USED

After his operation the patient is taken by theatre trolley to his room in the recovery ward. There he is transferred to the warmed bed, the theatre technician or orderly helping the recovery-ward staff. At the same time the technician or orderly conveys to the ward staff verbal instructions additional or supplementary to those given directly by anæsthetist or surgeon to the sister on one of her frequent visits to the theatre. These instructions include special nursing instructions or special points to be watched for in the recovery period.

The more experienced the staff becomes, the fewer instructions will be necessary. Before leaving the patient the theatre nurse gives the nurse-in-charge a written note confirming the operation performed and any special details of dressings, drainage tubes, &c., applied at operation. The patient is not left unattended until all reflexes have returned and any artificial airway has been removed. At this point the care may become intermittent, but a close watch is kept either directly or through a "port-hole" in the glass wall of the room. We have found that patients treated in this way, and left in a closely watched peace, will require little postoperative sedation, and will sleep, though easily roused, for many hours. During the postoperative period any treatment required—e.g., antibiotic therapy—is inaugurated or continued as necessary, the appropriate records being made in the ward treatment book. Sedatives are given as required and as ordered. This item, particularly in patients with facial fractures, requires close control. We have seen fatalities and near-fatalities from too early and overenthusiastic morphinisation; we have also seen the results of surgery destroyed in moments because the administration of morphine was timid or too long delayed.

Most patients stay in this ward until 9 A.M. on the morning after their operation. Throughout the twenty-four hours one or more members of the anæsthetic department are on call to deal with any emergency or point requiring advice or clarification. They will initiate transfusion, and advise on oxygen therapy, problems of feeding, and medication. They will be able to observe those occasional and often fleeting phenomena such as "thiopentone twitch"; the short period of nystagmus following emergence from barbiturate anæsthesia; the odd acts that some patients perform when emerging from anæsthesia, and so on. If a patient is gravely ill, his return to the ward is delayed until he is fit for transfer.

Before the patient leaves the ward on the morning after operation, the recovery ward produces a short note on the operation and subsequent treatment for the information of the patient's own ward staff. Therapy to be continued will be noted. Any extraordinary points of note will be recorded.

Each day the ward sister completes a record of each patient—including name, age, ward to which returned, operation, length of stay in the recovery ward, and any special notes on treatment, on postoperative sequelæ (e.g., vomiting and its nature and duration), on any cough, sore throats or headache, and on urinary function.

HOW MANY BEDS PER THEATRE?

Our ward has 10 beds in 10 rooms, but usually there are more than 10 operations on any normal work day. To avoid the direct passage of any patient to his own bed, thus short-circuiting the recovery ward, three expedients have been adopted:

(1) The inclusion of a second bed in one or more rooms; or the inclusion of two or even three cots for infants, in one room. Contrary, apparently, to the practice in some American clinics, segregation of the sexes is practised.

(2) The earlier return of some patients to their own wards. No such return is ever carried out except under the direct selection of the anæsthetist responsible for the particular case.

(3) The acceptance of one or two additional and suitably screened beds in the corridor itself. The patients so treated are always those provisionally selected for early return to their own wards. In these cases the patient's own bed is often obtained from his own ward.

One or more of these expedients is used on about four days in the week, but we do not regard them as satisfactory. The anæsthetic staff of the Mayo Clinic find 1 recovery bed per operating-theatre is adequate. Our experience over the last six years, is that, with the use to which we put our ward, 2 beds per theatre is *in*adequate.

The number of patients passing through the ward each year since it was opened is shown in the accompanying

ANNUAL USE OF RECOVERY WARD AT THE QUEEN VICTORIA HOSPITAL, EAST GRINSTEAD

—	No. of operations	No. of patients accommodated in R.W.
1946 (from February) ..	1882	1478
1947	2054	1687
1948	2396	1995
1949	2771	2387
1950	3160	2708
1951	3389	2809
Total	15,852	13,064

table. Patients who stayed in the ward for more than twenty-four hours are not counted more than once.

THREE POINTS OF VIEW

The Anæsthetist

From the viewpoint of the anæsthetic department the recovery ward has been nothing but a blessing. No patients have died in the immediate postoperative period. With but few exceptions respiratory difficulties have been met only in those types of cases in which they might have been expected. These have included patients with jaw injury or facial fractures; patients who have sustained damage to the floor of the mouth; patients who have to maintain abnormal positions postoperatively—e.g., the head fixed with marked lateral deviation and flexion following the attachment of an acromio-thoracic tube pedicle to the nose. Wherever difficulties or near-fatalities have occurred we have been able to institute immediate treatment.

With the introduction of controlled hypotension in surgery, the recovery ward became, to our mind, essential. Changes of posture after operation have to be so carefully controlled that we have felt that transport to a ward at a distance from the operating-theatre and the anæsthetist would be a bar, or at least a serious deterrent to the use of this procedure. To date about 10% of our 12,000 cases have been given controlled hypotension, and few, if any, have been returned to their own ward before the morning after operation.

The Nurse

When the ward was started the nurses feared that they would lose valuable experience in postoperative

nursing care in this branch of surgery. After a year we asked their opinion again. The result was interesting. Nurses who had worked on wards both before and after the recovery ward was started found that they would be unwilling once more to undergo the strain of the hazards of the postoperative care they had practised. Nurses who had worked on the recovery ward found that they secured a confidence in the handling of these hazards. Furthermore they saw the immediate postoperative results of virtually all the operations performed in the hospital. In a short period they would see a cross-section of all procedures carried out in the Plastic Surgery Unit.

The addition of this ward has not increased the total number of nurses of the hospital. Indeed the sister of the largest ward estimates that return of immediate post-operative nursing to her charge would oblige her to ask for five more nurses—i.e., the present number of staff in the recovery ward. In this hospital there are, besides this large surgical ward of 49 beds, two 30-bed wards; one 18-bed ward; two 12-cot wards, and 50 convalescent beds. Thus there may well have been a true reduction in the number of nurses required to staff the hospital.

We realise that the inclusion of a recovery ward in a general hospital which is also a nurses' training-school could well give rise to difficulties in ensuring that every nurse in her training would spend a period in the recovery ward, while ensuring that there was always an adequate cadre of experienced staff to maintain the ward at its peak of efficiency. Surely, however, such a problem should be capable of solution.

The Patient

The benefits to the patients have more than justified the expense of including a recovery ward in the original plans. Postoperative anxiety has decreased. There have been no deaths during the period. So strongly do we believe in the advantages of such a ward that we would welcome the opportunity of observing an adequate recovery ward at work in a general hospital. Difficulties occur in all types of anæsthetic service—often in those patients for whom one would predict an uneventful recovery period. For this reason we believe that all patients should pass through a recovery ward after operation. Selection of the patients before their recovery may well be uncertain. It is *not* always possible to determine which patient is going to give trouble. We would urge that all—or none—of the patients pass through a recovery ward. Thus there can be no regrets, or recriminations, for incorrect selection.

THE DESIGN FOR A RECOVERY UNIT

Combined Preoperative and Postoperative Unit

This would consist of two equal blocks connected by central offices consisting of sterilising-room, dressing-room, linen store-room, linen-sorting room, sluice-room and kitchen. Each block would contain a number of beds equal to the greatest number of operations performed under general anæsthesia in one day. Failing this ideal the number of beds would equal the average number of cases operated upon daily. For example, 3650 operations per year under general anæsthesia would require a minimum of 10 beds in each block.

On Sunday afternoon and evening patients for Monday surgery would be admitted and prepared for anæsthesia by the anæsthetic department. After surgery on Monday these patients would return to the beds in block A. During Monday afternoon the patients for Tuesday surgery would be admitted to block B for preparation. On Tuesday morning the patients from block A would return to their own wards. The staffing problem would be solved thus. On Monday block A staff would be at the level of one nurse to 2 patients, and block B one nurse to 5–7 patients. Tuesday, the reverse. For administrative purposes the staff of the two blocks would be considered as a single unit. The night staff of both blocks would be equal in size.

Postoperative Unit

Ideally the number of beds in the unit should equal the largest operation list done in the hospital; at second best, it should equal the average number of daily operations. But even a small number of beds can serve a most useful purpose. Anderson (1951) suggests that patients may be cared for in specially designed postanæsthetic stretchers, as an alternative to bed care. This assumes that the postanæsthetic patient is truly a migrant.

In this unit we have found that with a turnover of about 3500 operations a year, 10 beds are insufficient, but 15 beds would cover our present needs satisfactorily. As the operating turnover shows a persistent tendency to rise by 10–15% per annum, difficulties are likely to arise in the near future. We have asked that extensions to the unit should be included in the annual estimates of the hospital.

Some Desiderata

The following points, we feel, are of prime importance in planning a recovery department.

1. All patients undergoing general anæsthesia should pass through a recovery ward. Less work is involved in keeping the patients until the morning after operation than in maintaining a flow throughout the day, and the recovery of the patient is less eventful.
2. The number of beds should at least equal the average number of daily operations.
3. Each bed or pair of beds should be sound-insulated from the rest of the ward.
4. The ward should *not* contain a bathroom. It is sometimes difficult to resist a call for borrowing a bed. The absence of a bathroom makes a room less desirable, and the request easier to resist.
5. A "bed park" should be included. A reserve of assembled beds should be permanently available for use in emergency.
6. All beds should have removable head-pieces. We feel that this should apply to all hospital beds anyway.
7. Suction and oxygen should be beside every bed—preferably piped.
8. Each room should be shielded from the direct sun, yet light and airy. Each room should be capable of being darkened. The whole ward should be maintained at an even temperature.
9. The ward should be an appendage of the operating suite.
10. The ward should be the responsibility of an anæsthetic department.
11. The nursing staff should never be changed en bloc. Some experienced nurse must remain when staff is changed.

CONCLUSIONS

A few hospitals in this country and in America have started recovery wards. Those who have worked in such wards are unanimous in their appreciation of the service which they give to the patient.

Having a recovery ward does not mean that more nurses are needed: indeed it may reduce the number the hospital requires. Equipment is undoubtedly saved, particularly where pipe-lines for suction and oxygen are provided.

The capital expense of such a unit must be heavy, but the ultimate gain, primarily to the patient by virtue of the greater safety of his operation, and secondly to the hospital balance-sheet, is a stimulus to planning such departments.

At the moment a team appointed by the Nuffield Provincial Hospitals Trust is inquiring into the ideal lay-out for a recovery ward.

A set formula for the size of such a ward will be difficult, if not impossible, to find. Any plans made should allow for: (1) the care of *all* patients undergoing surgery with general anæsthesia; (2) close contact with other services—e.g., radiological and pathology departments; (3) a high level of staffing, with a permanent core of experience; (4) general supervision by the anæsthetic department; and (5) expansion.

Many names have been given to these units by different authorities. Might we plead for the use of the simple and descriptive term—recovery ward?

Our thanks are due to our surgical colleagues for their support of this experiment; and to Dr. A. A. Mason for the illustration. We, and all our patients, owe a great debt to the two sisters who have been in charge of the ward for dealing so generously with our requests and so understandingly with our experiments and whims.

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IMPERIAL CANCER RESEARCH FUND

THE annual general meeting of the Fund, held last Tuesday at the Royal College of Surgeons, with Prof. H. R. Dean in the chair, received the annual report for 1951–52 from the director, Dr. James Craigie, F.R.S.

Carcinogenesis.—Feeding experiments have been initiated by Mr. H. G. Crabtree to test the hypothesis that *p*-aminobenzoic acid (and possibly folic acid) may be a critical inhibiting factor in the genesis of liver tumours by azo-carcinogens. Results so far obtained are in conformity with this hypothesis.

Hormones.—Mr. P. C. Williams has continued the comparative study of the endocrine functions of the inbred strains of mice maintained in the Fund's laboratories. The investigation of possible neural control of adenohypophyseal function, by the late Dr. E. Vazquez-Lopez and Mr. Williams, reached a stage when a preliminary communication could be given at a Ciba conference last summer.

Ascites Tumours.—It had been found that survival of tumours in the frozen state could be accounted for by survival of a few cells which happened to be in a highly resistant state at the time of freezing. Ascites tumours provide a rich source of cells capable of assuming this resistant state and during the past year these tumours and various associated problems have been investigated by Dr. Craigie with the collaboration of Miss P. E. Lind, Miss M. Hayward, PH.D., and Dr. A. M. Begg.

Low-temperature Preservation of Tumours.—The use of frozen stocks has greatly simplified much of the experimental work, not only by eliminating the necessity of continued maintenance by serial passage but by providing easier control of dosage where this is critical. Recent tests of tumours stored in the frozen state for over two years show an activity comparable with fresh tumour fragments.

Mammary Cancer.—Dr. B. D. Pullinger has continued her studies of mouse mammary tumours at the Research Department, Royal Cancer Hospital, Glasgow. Since 1944 a pure line strain of mice has been bred having a mammary-cancer incidence of less than 2%. This substrain was derived by cross-suckling—to free it from Bittner's milk agent—from the R III strain, which previously had an incidence of about 80% of mammary cancer. Non-malignant adenomatous nodular proliferations have been found in about 20% of breeders over one year old, besides squamous and adenoacanthomatous nodules in another 20%. The cause is unknown. On account of their greater variety and later age-incidence the tumours resemble human breast cancer more closely than do those due to Bittner's agent.

Clinicopathological Research.—A research laboratory has been established in the pathological department at the Royal College of Surgeons, under the general direction of Prof. Geoffrey Hadfield. It was decided that the investigation should in the first place be restricted to cancer of the breast and prostate, and arrangements have been made with the Westminster Hospital, with St. Peter's Hospital and the Institute of Urology, and with the surgical unit of St. Bartholomew's Hospital. The collaboration of Dr. E. F. Scowen (St. Bartholomew's) has been secured. The staff consists of two pathologists, Dr. L. M. Franks and Dr. J. Stretton Young, with a senior and a junior technician, and Dr. George Lumb (Westminster) is an active member of the team.

This 49th annual report carries a historical supplement entitled Fifty Years of Cancer Research.

Medical Conferences

FATIGUE

ERGONOMICS RESEARCH SOCIETY'S SYMPOSIUM

A SYMPOSIUM on fatigue, organised by the Ergonomics Research Society, was held at the College of Aeronautics, Cranfield, on March 24–27. The programme covered most aspects of this ill-understood subject. The majority of speakers did not attempt to define fatigue, but Sir FREDERIC BARTLETT, F.R.S., who opened the symposium, proposed the following definition:

> "Fatigue is a term used to cover all those determinable changes in the expression of an activity which can be traced to the continuing exercise of that activity under its normal operational conditions, and which can be shown to lead, either immediately or after delay, to deterioration in the expression of that activity, or, more simply, to results within the activity that are not wanted."

Sir Frederic considered that abnormal conditions were not particularly suitable for the experimental investigation of fatigue. If the operator is submitted to excessive heat or cold, or intense noise, vibration, or buffetting, great heights, or great depths, the complications produced by such abnormal conditions, although they may accentuate "fatigue," make it difficult to evaluate the results. This is a point of considerable importance, as many of the investigations described in the course of the symposium involved studies under just such abnormal conditions.

It was clear both from his paper and that of other speakers that it is unlikely that any one definition will cover what is meant by fatigue. In fact, it is possible that this word, like "shock" and possibly "stress," has outlived its usefulness for scientific purposes. There are clearly many types of fatigue—mental and physical, acute and chronic—and it is all too easy for a valid description of one type to be confused with research in what amounts to an entirely different field. The word "fatigue" may therefore possibly be confined to conditions included within Sir Frederic's definition, and the word "stress" used for the abnormal conditions such as those mentioned above.

CRITERIA

Sir Frederic suggested three criteria of fatigue which deserved further study. Experimental study of muscular fatigue, using, for example, an ergograph, showed that sooner or later irregularities in the succession of events began to appear. These irregularities appeared without any awareness at all on the part of the operator. There was considerable evidence to show that the earliest and the most delicate criterion of the change in activity due to the continuance of that activity was an increasing irregularity of the successive items comprising the performance. It may well be that a similar increasing irregularity occurs in mental fatigue, although it is more difficult to measure such irregularities objectively.

The second criterion is disintegration of the field of display, with the consequence that the right actions are done at the wrong time and some actions may be omitted altogether. The field of display consists of all the items in the field concerned with the task in hand. Some of these items are more directly concerned with the task than others, which might be called outliers. The last are the ones which will be either ignored or emphasised at the expense of the central features as fatigue develops. These account for the "lapses" of behaviour which commonly mark advancing fatigue of body or mind. Some experimental work on this aspect of fatigue was described by D. B. BROADBENT.

The third criterion of fatigue concerns the subjective effects which are a common feature of a long-sustained activity. Localised discomforts, aches, and pains, and awareness of uncomfortable posture are amongst the

many and varied symptoms, which may well be related to the irregular timing and performance and the disintegrating display field which comprise the first two criteria. The disintegrating field may paradoxically extend the field itself, so that many elements of the total situation, external and internal, which did not command response in the unfatigued state now do so. That is to say, fatigue involves a progressive widening of the field from which selection is made, with a consequent loss of direction. It was pointed out by Bartlett that it was a characteristic of all these manifestations that they fluctuate, and what he described as a "dogged fortitude" would often carry a man through to a second wind.

ANATOMY AND FATIGUE

Some of these points were illustrated by papers with a different background. H. D. DARCUS, for example, described changes in muscular activity. He quoted the work of Knowlton et al.[1] in support of his contention that when a constant output of muscular effort is maintained there is a progressive increase in the muscular activity to produce the same amount of work, and this increase is due to an increasing contraction of individual muscles and to a recruitment of other muscles. As the muscle work progresses the activities cease to be smooth. Motor units, instead of contracting out of phase, tend to contract in groups. In alternating movements the period of activity also increases, so that muscles never relax completely. An operation demanding flexion of the middle finger will not involve movements of the other fingers initially, but as fatigue progresses the other fingers start to move involuntarily although they appear to achieve no useful purpose, and activity may be recorded from remote parts of the body. Finally, the muscles involved in the movement may fail, and in order to maintain output efforts are made to get the same results by using other muscles which may not be adapted to the particular work. These points, of course, are concerned with the first criterion of fatigue discussed by Sir Frederic Bartlett.

It is clear, that in this aspect of the study of fatigue there is real advance in the correlation of physiological and psychological observation.

J. W. T. REDFEARN described his investigations of finger tremor and demonstrated three main frequency components at about 30 cycles per second, 6–10 cycles per second, and 2–4 cycles per second, the highest of these frequencies being the natural frequency of the finger. The exercising of muscles which act on the finger increases tremor at the low frequencies. Severe general muscular exertion, not necessarily involving the muscles acting on the finger, also increased tremor in the 6–10 cycles per second band. On the other hand, sleep deprivation did not appear to affect tremor at all.

PHYSIOLOGICAL BACKGROUND

A. HEMINGWAY pointed out that muscle contraction can only be sustained if blood-flow through the muscle is maintained. A maximal contraction exerts such a tension on the blood-vessels that blood-flow through the muscle may be completely suppressed. This will prove a limiting factor in any sustained static work. On the other hand, provided that the contraction is not maximal, the muscle tension may not be sufficient to cut off the blood-flow; so there may be an increased blood-flow not only after contraction has ceased but during the contraction itself. In general, therefore, rhythmic work—alternating contraction and relaxation of muscle-groups—is more easily maintained for long periods because an adequate circulation will continue through the active muscles.

1. Knowlton, G. C., Bennett, R. L., McClure, R. *Arch. phys. Med.* 1951, **32**, 648.

Analysed solely in terms of neuromuscular activity, the failure of a muscle to continue to develop tension at the original level may be due to failure of the fibres themselves to develop tension, or of the nerve-impulses to reach and affect the muscle-fibres. Failure in the neural mechanisms might be due to impairment of conduction in nerve-fibres, or of synaptic transmission, or of muscle end-plates. It has been shown that, with continuous use, impairment can occur in all these situations despite the classical view that the muscle end-plate is the site of neuromuscular fatigue.

The transmission of nerve-impulses or the development of tension in muscle-fibres presumably entails a release of energy and the subsequent restoration of the system responsible for its release—a process which may depend on local resynthesis or the use of stored material. In the long run, continued restoration is likely to require the arrival of fresh material and the removal of products of activity.

The time of onset of fatigue at a particular rate of working may be determined, therefore, by the rate of transport of materials to or from the site of activity, and the maintenance of a store of material over a period will depend on supplementation.

In some instances the activity itself may have "side-effects" which prevent the full use of transport mechanisms by the working tissue. For instance, the circulatory adjustments necessary for temperature regulation during prolonged and severe muscular effort in a warm environment take a larger proportion of the available cardiac output than when the effort is made in a cool environment. Or, for another example, two forms of muscular activity may be equal in metabolic cost, but one favours the venous return to the heart while the other, owing to sustained muscular contraction, hinders it.

FACTORS IN ONSET OF FATIGUE

H. R. NOLTIE described his work on the effect of preliminary warming or limbering up in exercise performance. His results suggested that the size of the oxygen debt was decreased by preliminary limbering up, and this may delay the onset of fatigue in so far as it is due to oxygen lack.

NEGATIVE AND POSITIVE WORK

E. ASMUSSEN (Copenhagen) discussed the cost of negative and positive work. Negative work means muscle contraction, together with lengthening or stretching of the muscle: walking downstairs or lowering weights are examples. Asmussen has carried out experiments measuring the oxygen consumption at various levels of positive and negative work. Even at very high rates of negative work the oxygen consumption is low, and it may well be that this important fact could be taken into account by designers of machinery and equipment requiring muscular work for their operation.

WORK EVALUATION

E. H. CHRISTENSEN (Stockholm) described experiments to determine whether the tasks performed in a steel mill were too exhausting. There were many difficulties in using exact physiological methods to determine calorie expenditure, and Christensen therefore relied on a number of simpler measurements, including heart-rate, rectal temperature, skin-temperature, and, in a number of cases, oxygen consumption using the Douglas bag technique. He showed from previous work that in any individual, provided that the environmental temperature is not excessively high, oxygen consumption is directly correlated with heart-rate and also with rectal temperature, and that one may therefore derive from measurements of rectal temperature and heart-rate an approximate level of energy expenditure.

Christensen discussed the general applications of his work in industry from the point of view of what should be physiological criteria for sustained work. He proposed that half the maximum capacity should be the limit for

tolerable sustained work. Maximum capacity should be defined as the maximal oxygen consumption of which the individual is capable. The maximal oxygen consumption has been previously shown by Kjellberg et al.[2] to be directly related to the total hæmoglobin content or hæmoglobin mass, and this relationship holds good regardless of age and sex.[3]

These very important concepts put forward by Christensen aroused considerable discussion, and it is clear that more work is needed by physiologists before exact physiological limits of work can be laid down with assurance. However, some of the limits given by Christensen might be accepted provisionally, and work which exceeds such limits should be prohibited. There are obviously many important consequences of such ideas. There is, for example, the social problem of how much of a man's total energy expenditure should legitimately be demanded in his occupation. Should he be left so exhausted at the end of his work that it is only by complete rest during the remainder of the day that he is able to resume work the next day? Observations that have been made in factories show that individuals engaged in physically light work will spend their free time in active recreation, whereas the heavy worker often goes home and sits in a chair or may even go to bed.

FATIGUE ALLOWANCE

In opening the discussion on fatigue allowance, T. U. MATTHEW briefly reviewed the early history of factory practice, referring to the pioneer work by F. W. Taylor [4] and F. B. Gilbreth.[5] The essential feature of the Taylor system was to analyse a process into its simplest elements and to time each element by stop-watch. The method of the quicker man was carefully studied and a resynthesis made incorporating the quickest elements into a new method. The emphasis by Gilbreth was more on the best way of carrying through a process by discarding what were thought to be unnecessary movements, the techniques employed being those of the cine-camera and the chronocyclegraph. Current techniques of time and motion study are based very largely on the methods developed by Taylor and Gilbreth. Out of the analysis made by time and motion study engineers have developed a number of so-called "principles of motion economy," and these principles seem to be based upon an underlying notion of saving time and effort.

When all the analysis, resynthesis, and trial and error processes have been completed, it is then necessary to make an allowance—the fatigue allowance—to cover rest, supervision, and personal needs. The allowance is usually in the form of a percentage of the total time standardised for the job, and its negotiation is a matter of bargaining which only too frequently goes outside the realms of physiology and experimental psychology.

Matthew thought that it should be possible to employ physiological criteria in order to build up standard times for various tasks, but he was sceptical as to the reliability or the repeatability of the physiological measurements with which he was familiar. He suggested that the metabolic cost of the work might be a useful guide to the rating of the difficulty of work and thought that the optimum rate of working as shown by the oxygen uptake might be an acceptable standard rate of working.

In comment on this suggestion, it should be pointed out that in a demonstration to the Physiological Society (December, 1950) Crowden, Das, Floyd, and Silver showed that the metabolic cost is not necessarily the best guide where a decision has to be made between alternative methods of performing work. They discussed two methods of weight-lifting, one of which was more economical in energy consumption. Electromyographic study of the two methods employed showed, however, that the choice really lay between a method having lower energy cost but imposing greater strain on the intervertebral ligaments, with consequent risk of injury to the discs, and a method of higher energy cost but with smaller risk of ligamentous injury. This principle has wide implications. Work of low metabolic cost which appears to be economical may be performed in such a way as to throw a heavy load upon a small group of muscles or other structure, which might therefore tire rapidly. An alternative method of performing the task although consuming more oxygen might distribute the load more widely over several muscle-groups and so diminish rather than increase fatigue.

Conditioned-reflex experiments, neurophysiological studies, and the laboratory experiments of the psychologist have all emphasised the unitary nature of movements and patterns of behaviour. This is particularly true of learned skills which comprise the great majority of work tasks in industry. There is an interrelation between the various elements of a skilled movement, and it is not possible to interchange or modify the elements in an arbitrary fashion, as would appear to be done by the time and motion study engineer, without risk of interference with the pattern of behaviour in a way which may be ultimately detrimental to the final objective. The sequences of movement represent the interplay of sensory information with motor performance; at every instant of the movement there is interplay which enables the individual to achieve his objective in his own individual way.

When an elemental movement is taken from one context and placed in another it does not follow that it still occupies the same time for completion. It has to be built into the new pattern, and this may result in considerable modification in both the movement itself and its temporal pattern.

Production and performance are well known to depend in large measure upon adequate illumination; but the practice of the production engineer, inevitably perhaps, lags behind the laboratory study of this problem. There is, however, a wider aspect of visual problems, summed up in the word "display," to which relatively little attention has been paid in time and motion studies or by the production engineer. The operative in many factory processes is confronted by a continuously changing set of information of a visual character, and his reactions have to be adapted to the situation of the moment. There is often scope for judgment, but relatively little attention would appear to have been paid to the visual factors affecting judgment and action except by the experimental psychologist. Study of the "display" problem in the factory is likely to result in a more scientific approach to the production problem. Conrad [6] has recently summarised the work of the Medical Research Council's applied psychology research unit in relation to this problem.

MEASUREMENT OF FATIGUE

A. T. WELFORD developed some of the points discussed by Sir Frederic Bartlett and others. When a task can be carried out in several different ways compensation for impairment of one function can be effected by a change in the manner of performance which throws the burden upon other less affected functions. When this occurs the first signs of impairment may actually be an increase of over-all achievement. R. C. BROWNE, for example, in his paper pointed out that sleep deprivation may initially stimulate performance.

Welford went on to say that some of the excessive demand is on the receptor mechanisms; errors will arise due to the extraction of too little information from the display, and actions may become jerky. Similar results may occur if the load upon the receptor functions is increased by anxiety or by awareness of aches and pains.

A somewhat different point from those considered above concerns the effect of fatigue upon learning new

2. Kjellberg, S. R., Rudhe, U., Sjöstrand, T. *Acta phys. scand.* 1949, **19**, 136, 146, 152.
3. Astrand, O. Experimental Studies of Physical Working Capacity in Relation to Sex and Age. Copenhagen, 1952.
4. Taylor, F. W. Scientific Management. Harvard Business Studies, 1914.
5. Gilbreth, F. B. Primer of Scientific Management. New York, 1914.
6. Conrad, R. The Study of Skill by Motion and Time Study and by Psychological Experiment. 1951.

tasks. The method a subject builds up to deal with a new task depends partly upon the efficiency of the mechanisms he has available at the time. Impairment due to fatigue may dictate a method which is not optimal but which, once it is established, may be transferred to subsequent occasions even though the original fatigue is no longer present. The implications of this possibility for training are obvious.

THERMAL FACTORS

T. BEDFORD discussed the effect of thermal environment, describing the earlier work carried out by Vernon and himself which showed how output and accidents were related to the temperature in the factory. As temperature rose or fell above or below the comfort zone both output and accidents increased. It needs to be stressed that although there will be dramatic declines in performance only at the extremes of temperature, yet significant changes occur when the temperature is only slightly raised or lowered.

G. P. CROWDEN described the pronounced changes of temperature and humidity which can occur in a domestic environment, and he showed that the housewife engaged in the family wash may soon be in a tropical atmosphere: considerable deterioration in performance results. This investigation indicated the importance of studying work in the house as well as the factory.

WORK CAPACITY OF THE STARVING

ANCEL KEYS, who was the director of the famous Minnesota experiment on the effects of starvation, discussed fatigue and work capacity in starving man.[7] His volunteers lived first on an adequate calorie intake of 3500 calories, on which they performed muscular work so that they kept in balance. They were then transferred to a diet of 1500 calories for a period of up to 9 months, and attempted to perform the same amount of work. Work capacity declined on the low-calorie diet, and Keys suggested from his studies that the decline was directly proportional to the decrease in the active muscle mass. He thought that the contractile muscle power was constant for a constant mass.

However, it should be pointed out that there are significant cardiovascular changes in starvation, as described by Howarth [8]; and indeed these were also found in the Minnesota study. Such changes may prove to be one of the limiting factors in starvation, as well as the change in the mass of active muscle.

VISUAL FATIGUE

H. C. WESTON dealt with the importance of lighting in relation to "visual effort." He showed that when attention has to be concentrated in one part of the visual field, and the eye is subjected to a high level of brightness from another part of the field, the effort of attention leads to wrinkling of the face. The same subjects under the same illumination were found, however, to have a relaxed facial musculature when they were not required to pay attention. As a result of his wide experience of industrial situations where visual fatigue was said to arise, he had come to the conclusion that its avoidance was largely a question of the selection of operators so that the tasks which they have to perform fall within the range of their visual sensibility.

L. C. THOMSON, in his review of the physiological aspects of visual fatigue, pointed out that there is no sharp division between the emmetropic eye and the defective eye. There are small defects of vision which are not corrected for, and the use of the term "normal" is quite arbitrary. There is, in fact, a continuous distribution ranging from hypermetropia through emmetropia to myopia. Some "normal" people have exceptionally good vision; but many, although able to perform well at ordinary fine tasks, fail at tasks requiring the highest precision, such as the alignment of pointers on a vernier scale—a task which can be performed accurately to a few seconds of arc. A similar situation exists in regard to visual activity which involves hue discrimination. That is to say, there are grades of colour blindness in a quantitative sense, and industrial tasks involving colour matching can only be carried out successfully by those whose colour-matching abilities, in the quantitative sense as well as the qualitative, fall within the required range.

Thomson emphasised that it is common to speak of weak eyes and straining the eyes, but in relation to the ear we say "hard of hearing" and accept the fact that the ear is just defective in hearing quality. He pointed out that it is not possible to strain or damage the eye in most of the uses to which the eye is put.

There are, of course, the notable exceptions of heat damage to the eye which may occur in certain industrial situations or as a result of looking at the sun. Cataracts may arise from exposure to radiations—e.g., neutrons and X rays. The problem of snow-blindness may also come in this category, but it is ill understood.

The difficulties of vision arise when the job calls for a higher grade of vision than the operative possesses. The way to avoid visual fatigue is to see that the operative has the sight necessary for the job.

ACTION-POTENTIALS

T. A. RYAN (Cornell) described experiments in his laboratory on the recording of muscle action-potentials from facial muscles and limb muscles in an attempt to find evidence of effort in visual tasks. With tasks of given difficulty no correlation was found with the level of illumination or with the distribution of illumination in the visual field, but with a fixed illumination there were changes in the action-potential discharges closely related to the internal difficulty of the task as judged by the psychologist. That muscle action-potential discharges are concomitants of effort may provide yet another method of assessing the "difficulty" of the task.

CONCLUSION

Although this symposium was inevitably discursive, it was a stimulating experience to attend it. The advances in many different fields, although not spectacular in themselves, when they are brought together certainly give hope that this intractable problem may be solved. There appears to be a strong belief that there are physiological changes in fatigue, if only they could be measured, and that these changes ought to be associated with the alterations in performance described by psychologists. Of the three criteria proposed by Sir Frederic Bartlett, the first at any rate—development of irregularity in muscle performance—should be susceptible to detailed physiological investigation.

Perhaps a general mistake is to regard fatigue as an evil. Sherrington [9] said in 1906:

"Therefore . . . fatigue and freshness . . . are physiological factors influencing the result of the interaction of reflex arcs at a common path . . ."

"Fatigue therefore in the long run advantageously redresses the balance of an otherwise unequal conflict. We can recognise in it another agency working toward that plastic alternation of activities which is characteristic of animal life and increases in it with ascent of the animal scale."

"[Fatigue] seems a process elaborated and preserved in the selective evolution of the neural machinery."

O. G. EDHOLM
W. F. FLOYD.

7. Keys, A., et al. The Biology of Human Starvation. Vol. 1. Minneapolis, 1950.
8. Howarth, S. Cardiac Output and the Peripheral Circulation. *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 275, 1951; chap. 20.
9. Sherrington, C. S. The Integrative Action of the Nervous System. London, 1947; pp. 224, 232.

In England Now

A Running Commentary by Peripatetic Correspondents

PEOPLE talk as if Leonardo's life was a succession of noble failures. They speak of machines and masterpieces that came to nothing and they mourn lost folios. It isn't reasonable. Leonardo created lavishly, like Nature, but at heart he was an experimenter and contemptuous of survival. The mark of the genius manqué is that he is so far in advance of his age as to be incomprehensible. By the time the public has caught up with his thought his idiom is out of date and has lost its appeal. Samuel Butler, the younger, is an example, and perhaps Whistler. But Leonardo is different. He is acceptable to every age. His creations sparkle through time like shooting stars, to light each era for a space and then vanish. The Renaissance had the benefit of his armouries and the *Last Supper*; we can enjoy the eddies of blood round the cardiac valves and the sublime countenance of St. Anne.

* * *

The final fellowship vivas at the Royal College of Surgeons are a rich source of material for the story-teller, whether his forte is Truth Nicely Told, like the asparagus tale from South Africa (March 29, p. 667), or Fiction Inspired by Fact. Here are two which, though unoriginal, are neither crude nor rude.

In the pathology viva the examiner looked up and saw that the next candidate was a nice-looking young man, rather shy, wearing the tie of the United Hospitals Sailing Club. His face seemed vaguely familiar, so as he sat down the examiner greeted him with "Good morning, Mr. Smith. I'm sure we have met before. Can you remember where it was?" "Yes, sir," replied the candidate, "it was at this table." This was an unfortunate start, and the examiner hastened to reassure him. "Never mind about that," he said lightly, "tell me the first question I asked you last time." "Yes, sir," said the young man, "you asked where you had seen my face before."

The second incident occurred during a viva in operative methods. The examiner asked the candidate how he would treat a fracture of the lower third of the humerus.

Cand. "I would put it in plaster, sir."
Exr. "How long would you leave it?"
Cand. "Six weeks, sir."
Exr. "What would you do then?"
Cand. "I should take off the plaster and X ray it."
Exr. "Suppose it hadn't united, what would you do?"
Cand. "I would put it into plaster, sir."
Exr. "For how long?"
Cand. "Six weeks, sir."
Exr. "What would you do then?"
Cand. "I would take off the plaster and X ray it."
Exr. And if it still was not united, what would you do next?"
Cand. "I should put it into plaster, sir."
Exr. "Look, Mr. Smith. How long are you going to spend putting this fracture into plaster and taking it out again?"
Cand. "I am going on till the bell rings, sir."

* * *

The Medical Art Society belong to that dwindling group of people who would rather have a dash at doing something themselves than talk about the way other people do it. Their annual exhibition of paintings and drawings, now in progress at Walker's Galleries, New Bond Street, is thus an adventure in character as well as in art. The picture of the year, to my mind, is a small grey affair, possibly a lithograph, by Brian O'Doherty, called "Waiting—On District, Rotunda," so unkindly hung that it has to be examined kneeling. It shows the simplified structure of a bored student, waiting for the simplified structure of a distant mother to wake up and get on with the pains; and it has pattern, character, and atmosphere. Still, I daresay it was a deal easier to do (given the eye to see the thing) than the competent water colours near it. Two nice sober examples are F. N. H. Maidment's "The mill road, Bosham," and Reginald Morshead's "Shoreham by Sea"; but there is less of an air of fluent habit about the grey-greens of Ian G. Robin's "Ilex avenue." "Lott's Cottage," as painted by Eric Topham, seems to have been done up since Constable had a go at it, and now has two dogs, one of them blue, in the garden; but it may be a different Lott. Stella Churchill paints for pleasure—and why not? Isabel Wilson saw a bleak little tree during her "Winter in London" and recorded it gracefully. Holmes Sellors fortunately knows more anatomy than appears from his "Street Scene," but the grouping is pleasant and odd, and the colours well placed; and Emanuel Miller's crayon of a man sleeping is very nice indeed.

The full-blooded will relish the cheerful vulgarity of R. H. Dale's "What do you mean—' forgot to put the film in the camera?'"—evidently a historic scene, only slightly caricatured, in some authentic operating-theatre. The gallery of students, behind their pane of glass, will perhaps give even more pleasure than the contending giants in the arena. The drawing of this is very clever, and so is that of Anthony Reford's "The toilet," with three stout pink ladies attempting to share a saucer of a bath; but the two pictures have little in common besides their exuberance, for one belongs to the students' magazine and the other to the eighteenth century.

On the whole the oil paintings are gallant rather than successful. Harold Avery, having given a convincing account of Copenhagen, shakes one's credulity with his too-blue water. Harold Gillies takes us with more assurance into some wild romantic country in Glen Clova and Norway; and A. B. Hewlett into the strangely orderly world he inhabits whether in France or anywhere else. Anthony Reford has done the head of a girl, a young grubby untidy girl, which is worth a good long look; and among the other portraits B. E. Barsby Smith's "Miss Plunkett" challenges one earnestly, like a woman doctor taking a case-history. W. G. Scott-Brown has some agreeable alpine scenes, and R. A. Bearer a very gloomy view of Marylebone, that most light-hearted and winning of stations. On the other hand Norman Ashton has robbed cacti of their sting in a thoroughly cheerful composition. The "River Test at Totton," according to Reginald Morshead, is full of still light, and could be lived with happily for a lifetime.

* * *

Science moves so fast these days that the older generation of surgeons cannot all be expected to keep up with the most recent mysteries of laboratory diagnosis. Thus when the discussion on a round turned to the Salmonellæ, our chief asked a student how the various species were identified, and received the concise reply: "By slide agglutination with monospecific antisera, Sir." "Oh, I see," said the surgeon in a voice that sounded ever so slightly vague. As they moved on to the next bed one of the firm remarked to a colleague: "I don't think he was quite with you there, old man."

* * *

I believe I have chanced on one of those new viewpoints that suddenly change the whole face of medicine, as one imagines oneself doing when reading about Hunter, Pasteur, and er—well, the other men who have made medical history.

I was gazing at my newborn infant at a time when I had been rereading my midwifery with the Canadian qualifying examinations in the offing. She looked confused and unhappy, as most infants do. Then in a flash it occurred to me why this was so. For at least two months she had lain head downwards in utero and now suddenly she had been forced into a horizontal attitude, or when not horizontal was held head upwards. Surely this sudden change must account for her confusion? Had she not suffered enough insults in parturition without this additional vasomotor disturbance?

Can I persuade the next generation to nurse and feed their babies upside down? I can foresee the hitherto resistant neonatal mortality figures at last tumbling down like the other mortality figures. My name may even be added in a footnote to the standard textbooks—who knows?

Letters to the Editor

APPOINTMENT AND QUALIFICATIONS OF CORONERS

SIR,—By the Coroners (Amendment) Act of 1926 no person may be appointed a coroner unless he is a barrister, solicitor, or legally qualified medical practitioner of not less than five years' standing in his profession.

This society, all the members of which are members of both the legal and the medical professions, is seriously disturbed at the fact that some local authorities, in whom the power of appointment is vested, are seeking to avoid or to limit the candidature of medical men for the appointment of coroner. In Essex, where a vacancy has recently occurred on the death of a distinguished and doubly qualified coroner, the county council has taken the retrograde step of inviting applications from barristers and solicitors only. In London, by a resolution of the County Council in 1937, future appointment of coroners was limited to those possessing legal qualifications of five years' standing or those possessing legal qualifications of less than five years together with medical qualifications of five years or more; and this resolution has been recently reinforced by a letter from the council to the London coroners stating that the same provisions will now be applied to the appointment of deputy coroners. My society feels that this decision will merely increase the very great difficulty which already exists in finding persons with appropriate qualifications who are willing and able to act as deputy coroners.

The greater part of a coroner's work is not done in open court, but in his office; in the populous districts in the jurisdiction of members of this society, more than three-quarters of the reported deaths are dealt with as non-inquest cases, after a post-mortem examination. In the reading and assessment of a pathological or a necropsy report it seems unlikely that any great advantage will be found in legal qualifications and experience, rather than those of the trained medical mind; and it is of interest that the ratio of inquest cases to non-inquest cases tends to be higher where the coroner has no medical knowledge or qualification.

I believe that a committee of the B.M.A. which considered, among other things, this very question was of the opinion that it was desirable that coroners should have both qualifications, but that they should certainly be medically qualified; the matter is clearly of importance to your readers, and to the public.

Westminster Coroner's Court,
Horseferry Road,
London, S.W.1.

C. J. F. BARON
Hon. Secretary,
London and Home Counties
Coroners' Society.

TRAFURIL

SIR,—I was greatly interested in the significant communication on the action of 'Trafuril' in rheumatoid arthritis, by Dr. Nassim and Mr. Banner (April 5). I have used trafuril in various forms since 1949, and some preliminary results have been reported.[1] The variation in skin reaction described by Dr. Nassim and Mr. Banner was noticed.

My personal experiments included the intramuscular injection of trafuril. This is usually followed by flushing of the face and upper extremities with, in some cases, loosening of the finger-joints and increase of the grip. It was seen, however, that occasionally the usual flushing and burning sensation of the face and forehead failed to appear, or were very slight, and there was no increase in mobility of the fingers or in power as recorded by the pleximeter.

More accurate assessment of the effect of trafuril should be possible by intramuscular injection than by application of the cream. Personally I now reserve the cream for personal use by the patient, who is directed to apply it to the myalgic spots, which of course may be quite remote from the pain area. If surface application is desirable in the consulting-room, I find that the tincture applied with an ordinary $^1/_2$ in.-wide paint-brush is equally effective, and pleasanter for the patient.

Here again the erythematous effect may be entirely absent. Hitherto, perhaps naturally, I have regarded this lack of response as having some connection with the type of epidermis, but now it appears that the cause may be much deeper and have a more fundamental significance. I agree with Dr. Nassim and Mr. Banner that the vasodilation is not mediated by histamine, as trafuril is perfectly well tolerated in extreme cases of histamine sensitivity; nor, I understand, is the effect obviated by the anti-histamine drugs.

I also have pleasure in recording the generosity of Messrs. Ciba Ltd. in providing the drug.

London, W.1. H. WARREN CROWE.

1. *Rheumatism*, 1951, **7**, 75.

WHAT SHOULD THE NURSE BE TAUGHT?

SIR,—In their letter of April 5 Dr. Cropper and Mr. Houghton say that employment in hospitals should be available for girls leaving school who wish to nurse. Our experience is that the majority of girls who enter hospital at the age of 15 lose interest before they can begin their vocational training at 18, in order to become State-registered at 21. The girl of 15 who is interested in nursing should be advised to continue her general education, or, if that is impossible for economic reasons, to find remunerative work to do to fill in the time, the opportunities for this outside the hospital world being manifold. The work that is often suggested for these young girls inside the hospitals is, in many cases, being done by clerks, receptionists, and ward orderlies. Are these people to be thrown out of employment in order that work may be found for schoolgirls? If in the meantime these girls lose their interest in nursing, they will be no loss to the profession; for it is only those who have a real desire to help sick people that we want in our hospitals.

Your correspondents' second point is that the nursing curriculum should be limited to matters truly relevant to a nurse's duties. If this suggestion were adopted and theory was not taught, our nurses would be reduced to mere auxiliaries; but they would also be expected to carry out complicated treatments without any understanding of what they were doing. The danger of serious mistakes due to that lack of understanding would be bad enough, but even worse would be the effect on recruitment. Few intelligent girls of 18 who had passed their General Certificate of Education in a number of subjects at the ordinary or advanced level would consider entering a profession in which they were denied sufficient elementary knowledge to enable them to understand the more technical aspects of their calling. This state of affairs would arise at a time when opportunities for education beyond the normal school-leaving age are open to an increasing number of girls. Many hospitals in this country have the opportunity of recruiting an average of 100 girls of this educational standard each year.

Most of these girls, if they followed the curricula laid down by some of the Canadian and American Schools of Nursing, could quite easily obtain a degree in nursing. But the student nurses in this country prefer to nurse the patients. The suggestion that our system of training is too theoretical is a great exaggeration. In her first year the student nurse spends her time ministering to the fundamental needs of her patients—blanket-bathing, bedmaking, bedpan rounds, &c. Meanwhile, as she

gains more confidence, she watches and is given instruction in more responsible treatments—giving injections, doing dressings, &c.—which she does by herself in her second year. In her third year she develops her skill and is given some responsibility for the simple work of her juniors. The result is a competent, intelligent nurse in whose care physicians and surgeons can leave their patients with confidence.

I cannot understand why Dr. Cropper and Mr. Houghton think that the Preliminary Training School period is a cause of wastage. I have spoken to hundreds of nurses about this, and without exception they thoroughly enjoy that part of their training.

As to the psychological aspect of nursing, student nurses do in fact have a few lectures in elementary psychology; but the real understanding of the patients' mental needs can only be learnt by the example of the trained nurses and the doctors, and it is unfortunate that sometimes, under the stress of events, both of these fail in this respect.

Your leading article showed, in my view, more understanding of the knowledge and training required by the nurse if she is to be a real help to the doctor on both the human and scientific sides of his work.

London. M. MARRIOTT.

SIR,—The Matron of Addenbrooke's calls attention to an old evil in modern dress when she speaks of "far too many hospitals where, for lack of other staff, young girls are employed in actual nursing duties not only on day but on night duty." Over the past twenty years you have allowed me space to record instances that had come to my notice, as one child after another in mid-teens had been sucked into hospital or nursing-home service to emerge stricken for death, or long invalidity, by some form of tuberculosis. Such cases seemed to be "just one of those things" of which contemporaries take little note but which historians paint in flaming colours.

Miss Ottley dares to take the historic view when she states "in our twentieth-century health service children are engaged in nursing the sick. Can we, of all people, members of the medical and nursing professions view such a situation with equanimity?"

Moor Park, Herts. ESTHER CARLING.

SIR,—The Cropper-Houghton syndrome (April 5, p. 716) is only one manifestation of a more widely spread malady—morbus academicus, or foie-gras disease. Its root cause is the vested interest of the academies, a very powerful interest, and no less powerful for being largely unconscious. Most teachers agree cordially that the curriculum is overloaded; few will *do* anything about it. The dead leaves are all in the other man's quadrangle, and any suggestion that a broom could be used in their own little nooks will be fiercely opposed.

There are many dead leaves, indeed whole dead branches; a broom is not enough; saw, shears, and pruning-hook are needed as well. There is failure to discriminate between principles, which must be learned, and the details which illustrate them; between facts important to nurses, and facts important to physiologists, bacteriologists, biochemists, surgeons, physicians, gynæcologists, and all the other people who help the nurse to care for the sick; and between facts immediately necessary for doing her daily work, and facts she can look up if she has to, about which it is enough to know where they can be found.

But let nurses be glad of two things: they are young enough to forget, and at least they are not medical students—the most incomparably stuffed geese of our generation.

Giggleswick, Settle, Yorkshire. D. P. LAMBERT.

CEREBRAL SYMPTOMS IN CARDIAC INFARCTION

SIR,—The case described by Dr. Batty Shaw (April 12) suggests that the symptoms of left cerebral dysfunction followed an anoxic tissue acidity (due to the sudden fall of blood-pressure), engendered by the vascular reactions to the right-sided old softening.

Similar brain dysfunction with mental or neurological symptoms also follows other cardiovascular derangements, as in our mental patients. They are analogous to the cases of mesencephalitis described by Dr. Bickerstaff and Professor Cloake.[1] These associated clinical and necropsy (or deduced) findings are understandable from the viewpoint of my book.[2]

Birmingham. F. A. PICKWORTH.

BENIGN LYMPHOCYTIC MENINGITIS IN co. DURHAM

SIR,—In the article by Dr. Smith and Dr. Kinsella[3] I was surprised to read: "Benign lymphocytic meningitis was provisionally diagnosed, but owing to the anxiety of the parents and the obvious illness of the child it was felt justifiable to make a lumbar puncture."

The differential diagnosis of benign lymphocytic meningitis is tuberculous meningitis, and these two conditions can be differentiated only by lumbar puncture. With streptomycin available for the treatment of tuberculous meningitis, not to exclude this diagnosis as early as possible would be folly.

Central Islip State Hospital, New York, U.S.A. M. G. JACOBY.

LEONARDO'S LEFT HAND

SIR,—I have read with interest Mr. Capener's article last week. Why were all the legends in Leonardo's drawings written, not in ordinary Italian script, but in "mirror-writing" with the words read, and spelt, and each letter pointing, from right to left? This question was posed also at the Osler Club Symposium on Leonardo da Vinci but brought forth an equivocal reply.

It could not be a mere cryptogram, though it would make the script difficult to decipher and tedious to read—certainly to any onlooker!

I venture to suggest the following explanation for the use of the "mirror-writing." Leonardo received no regular education in his youth (in which and many other respects a parallel can be drawn between his life and that of our own celebrated John Hunter). He knew no Greek. His contemporary biographer comments on his lack of knowledge of Latin. The only other language known to his erudite contemporaries was Hebrew (even in the *Fabrica* of Vesalius, in 1543 and 1555 editions, Hebrew words adorn some of the full plates). The words of this language are spelt, read, and written, while the letters tend to point, from right to left, the paging being in the same direction. There is no reason to think that Leonardo was unfamiliar with these facts, while his left-handedness would render it more natural to adopt these hebraic literary characteristics.

Another point would have influenced him. All books had to be published in Latin. Certainly the vernacular was taboo. He could not use Italian. It will be remembered that a storm of criticism broke about the head of the famous French physician Jean Fernel in the fifteenth century, when he created a precedent by publishing one of his later medical works in the vernacular French. One of the reasons adduced in favour of retaining Latin as the language of medical publications was to prevent this knowledge reaching the illiterate barber surgeons, who were unversed in the Latin tongue. When Fernel was charged with thus bringing medical knowledge to the

1. Bickerstaff, E. R., Cloake, P. C. P. *Brit. med. J.* 1951, ii, 77, 362.
2. New Outlook on Mental Diseases. Bristol, 1951.
3. Smith, R. C. F., Kinsella, J. J. *Lancet*, 1951, ii, 882.

surgeon, his retort was: "Fear not, for the barber surgeons cannot even read French."

The type of cryptogram first introduced by Leonardo has a subsequent parallel. In the archives of the Cavendish Laboratories at Cambridge, there are preserved some letters by the famous mathematician Clerk Maxwell, in which he writes many of his English words using the Greek hieroglyphics—a manœuvre I have on occasion used in the past in my hospital outpatient case-records to preserve my unpalatable diagnoses from the prying eye of the νευρασθενικ patient.

London, W.1. N. ASHERSON.

A.C.T.H. IN ERYTHEMA MULTIFORME EXUDATIVUM MAJOR

(STEVENS-JOHNSON SYNDROME)

SIR,—The ætiology of erythema multiforme exudativum remains obscure and treatment largely unsatisfactory. Recent publications have dealt with the history, nomenclature, and ætiology of the condition.[1 2] The name "Stevens-Johnson syndrome" has been suggested for the major or severe form, and the suffix "Hebra" for the mild form without stomatitis and ophthalmia.

Efforts to find a virus or other infectious agent have been inconclusive or negative. A virus has been sought without success in the usual laboratory animals and in horses, cows, sheep, pigs, and embryonated eggs.[3 4]

In 1950 we saw an 8-month-old boy with characteristic erythema multiforme exudativum major, with polymorphous rash, oral ulceration, conjunctivitis, keratitis, balanitis, and extensive pneumonitis. He had become progressively worse during 2 months' treatment with antibiotics, sulphonamides, blood-transfusions, and dietary alterations. On the premise that sensitisation may play an important part in the evolution of this syndrome, he was given adrenocorticotropic hormone (A.C.T.H.) (Armour). There was a striking response within 4 days, and the lesions began to clear up.

The illness began on Aug. 30, 1950, with cough and rhinitis, succeeded in a few days by vesicular lesions in the mouth and on the scrotum, followed shortly by conjunctivitis, keratitis, irregular fever, rapid loss of weight, and radiographic signs of scattered density in both lungs. Before having A.C.T.H. he received sulphadiazine, penicillin, streptomycin, aureomycin, chloramphenicol, repeated blood-transfusions, and soya-bean and casein digest substitutes instead of a cow's milk diet. Fever was irregular, weight loss progressive, and pulmonary signs, both clinical and radiographic, continued for 2 months. Local therapy (antibiotics, gentian-violet, drying lotions) did not modify the course of the illness.

Bacteriological examination of the blood, saliva, urine, and ocular exudate was negative. The bone-marrow was normal; red-cell counts showed a mild hypochromic anæmia; white-cell counts ranged from 10,500 to 27,200 in ten counts, and no eosinophils were seen except on Sept. 19 when they numbered 5% of a total of 14,000 cells.

On Oct. 25 he was given 20 mg. of A.C.T.H. every 6 hours. Within 4 days the oral and ocular lesions began to resolve. A radiograph of the chest taken after 5 days' treatment with A.C.T.H. showed a remarkable change. A film taken just before treatment showed "involvement of all lobes, the uppers most severely; consistent with a clinical diagnosis of fungus infection." The next film showed "marked improvement and resolution in all involved areas." The dosage of A.C.T.H. was reduced to 15 mg. every 6 hours on Oct. 30 and to 10 mg. every 8 hours on Nov. 6. It was stopped altogether on Nov. 13. A follow-up note and photograph one year later indicated normal growth and development with no recurrence of symptoms or signs.

A considerable effort has been made to find an infectious agent responsible for this syndrome. Maculopapular forms of erythema multiforme have been observed in a variety of infectious diseases, but none simulating the complete picture of erythema multiforme exudativum major. Such rashes are generally ascribed to an allergic response to the infecting organism. One of us has seen a child who, during the course of acute primary herpetic gingivostomatitis in which the herpes virus was isolated and there was a rise in the specific antibody titre, developed erythema multiforme of the more usual type, as seen occasionally during the course of various infections. The picture could scarcely be confused with erythema multiforme exudativum major, despite the gingivostomatitis.

We think that the ætiology of this condition is multiple, but that sensitisation is important. Under such circumstances A.C.T.H. or cortisone should be effective. In the presence of mucosal lesions of this type antibiotics orally may be ineffective and even risky.[5]

University of Louisville, Kentucky. ALEX J. STEIGMAN
J. J. KELLY.

TREATMENT OF SCARLET FEVER

SIR,—It appears that in 1950 there were 65,883 cases of scarlet fever notified in England and Wales, compared with 56,851 cases in the whole of the United States. A World Health Organisation survey[6] concludes that "Europe is still the world epidemic centre" for scarlet fever; but I believe that these figures may more truly represent the enlightenment on the other side of the Atlantic in making no diagnostic distinction between streptococcal throat infections accompanied by a rash and those not so accompanied.

Hildenborough, Kent. C. GLAISHER.

AN UNUSUAL EPIDEMIC

SIR,—I have been extremely interested by the many letters reporting cases of an "unusual epidemic." This illness is apparently not limited to England; and in the past two months I have seen about 35 such cases, which I am tempted to call encephalitis.

The clinical picture is variable, but the most prevalent symptoms are headache and vertigo. The headache is not very acute, and in many cases it is more a vague feeling of heaviness. Often the patients complain of pain at the back of the head and in the neck, and pressure on the point of emergence of the great occipital nerve is generally painful. Vertigo is commonly also present, though it may be lacking; in my experience it is generally mild, however long it may last.

A few patients have complained of temporary impairment of their mental faculties. A woman told me that, having to add up a few figures, she said: "five and five make thirteen"; and a man was worried because he could not write an ordinary letter without making a mistake every other line. In no case was the headache strong enough to explain per se these other troubles. Occasionally I have noticed stiffness of the neck and—especially in children—positive Kernig's sign.

In one case only were the symptoms severe enough to warrant a lumbar puncture, and the cerebrospinal fluid was almost normal.

Curiously enough, for a disease which seems to be contagious, I have never met two cases of it in the same household. This may be explained by the existence of subclinical forms, as I heard of people having suffered from headache for a day or two only.

Intravenous injections of sodium salicylate may not be entirely devoid of effect; but aureomycin seems specially useful. A large number of patients quickly recovered after 2 g. a day for 4–5 days, whilst untreated cases may apparently last 2–3 months.

The impression is that this is a viral disease. Whether all the cases reported in your columns are of the same disease, and whether the epidemic I have seen in

1. Ashby, D. W., Lazar, T. *Lancet*, 1951, i, 1091.
2. *J. Amer. med. Ass.* 1951, **146**, 1424.
3. Commission on Acute Respiratory Diseases. *Arch. intern. Med.* 1946, **78**, 687.
4. Anderson, J. A., Bolin, V. *Arch. Derm. Syph., Chicago*, 1949, **59**, 251
5. *Lancet*, 1951, ii, 532.
6. See *Times*, April 19, 1952.

Normandy is related to the "unusual epidemic" you describe, is more than I can tell. But all our patients have a few features in common.

Messei, Orne, France. GABRIEL MOUCHOT.

AGE AT ONSET OF TUBERCULOSIS

SIR,—Your leading article on contact examination (March 8) points out the difficulty, and importance, of fixing the age at which the risk of tuberculosis increases. It is agreed that resistance to the disease is lowered during the period of sexual development, and that ideally the incidence should be related to physiological rather than chronological age. The term "puberty" (which means the state of being capable of procreation; legally, in this country, achieved at the age of 14 years in boys and 12 years in girls) is commonly used rather vaguely to describe the period of transition from childhood to adolescence. Some degree of accuracy may be obtained in females by using the menarche as a fixed point, but no such convenient incident occurs in males. In practice, therefore, the use of puberty as an epidemiological landmark must be considered unsatisfactory. Furthermore, as your article emphasises, the Ministry of Health age-group classifications are not ideal, though they probably are the best that can be contrived for the analysis of large-scale notification figures.

A more rewarding line of approach is to study the clinical histories of children with manifest phthisis (progressive pulmonary tuberculosis of "adult" type).

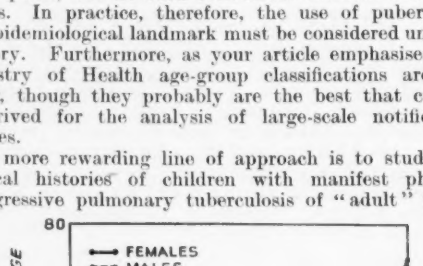


Fig. 1—Average age on diagnosis of pulmonary tuberculosis in five series in the U.S.A. and Germany (a total of 614 cases).

Since the discovery of such disease nearly always leads to early treatment, sanatorium and clinic records should yield the age of each individual at the time of diagnosis. Reports of such investigations have been published in America by Chadwick and Zacks,[1] Gibson and Carroll,[2] Karan,[3] and Morgan,[4] and in Germany by Pietsch.[5] The averages from these five reports are shown in fig. 1. The graph from each approximates closely to the average. Fig. 2 illustrates the findings in a series of 60 personally collected cases from Poole Sanatorium and the neighbouring chest clinics, observed during the period 1938–51. In all the reports the patients were white children.

Several points of interest emerge from all these series:

1. Only about 13% of the cases of phthisis in children occur below 10 years of age, and the sex-incidence in these is equal.

2. In girls the incidence rises sharply after the age of 10 years.

3. A less distinct rise in boys is seen after the age of 12 years, and the male graph roughly parallels the female with an interval of 2 years.

4. Between 11 years and 15 years there are nearly three times as many cases in females as in males.

If this analysis is acceptable, one may say with some confidence that the age at which the risk of tuberculosis begins to increase is 10 years in girls, and, less definitely, 12 years in boys. The striking agreement in age-incidence between the six reports, despite differences of race and environment (racial differences in the age at puberty are probably not great), seems to give authority to this observation.

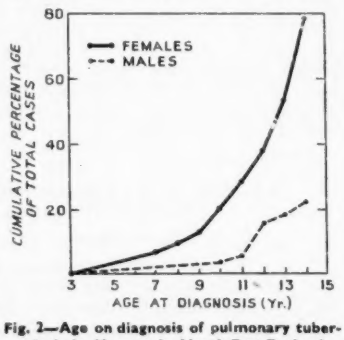


Fig. 2—Age on diagnosis of pulmonary tuberculosis in 60 cases in North-East England.

The low total incidence of phthisis in childhood reported in the two publications referred to in your leading article can be confirmed from other sources. Combined information from notifications, tuberculin surveys, mass radiography, and published work on this subject suggest a total incidence in tuberculin-positive white children of not more than 0·1% below 10 years of age, rising at 15 years to about 0·5% in girls, and 0·2% in boys.

Poole Sanatorium,
Nunthorpe, near Middlesbrough. J. P. ANDERSON.

RHESUS NOMENCLATURE

SIR,—Since my letter appeared on Feb. 2, I have encountered numerous other C-D-E equivalents for the phenotype Rh_1rh, in addition to the dozen previously listed. Some of these are

$$\frac{CDe}{c\ \ e},\ CDece,\ \frac{++-+++}{C\ D\ E\ c\ d\ e}.$$

It is significant that only a single champion has come forward to defend the Fisher-Race notations. As his "solution," Dr. Allan (March 22) suggests still another modification of the C-D-E notations, thus confounding confusion.

Brooklyn, New York, U.S.A. A. S. WIENER.

MORE MANURE

SIR,—Yours are not the columns in which to compare the merits of "muck and magic" with the views of the devotees of hydroponics, but we are all sensitive to the prospects of our food-supply. The county engineer of Dumfries, to whom you refer in your annotation of April 12, is to be congratulated on a practical attempt to remedy one effect of the agricultural tractor; and, whilst doctors are understandably more concerned with the pathogenic bacteria, there is a view that the compost heap and farmyard manure owe their usefulness to the contribution that is made to the bacterial flora of the soil, for there is no reason to assume that the soil flora is always self-balancing.

It would be a pity if the innocence of the Dumfries compost failed to be proved and the matter were abandoned; for, whilst the presence of pathogens is demonstrable in our sewage effluents, this may be a reflection more of existing treatment difficulties. If these matters needed exploration one would suggest that the sewage from a sanatorium or general hospital might provide an abundance of testing material, but against this bacteriologists would be saddened by the thought of the mass of antiseptic which goes down the same drains. It sometimes happens that a new hospital or sanatorium is

1. Chadwick, H. D., Zacks, D. *J. Amer. med. Ass.* 1927, **89**, 670.
2. Gibson, C. B., Carroll, W. E. *Amer. Rev. Tuberc.* 1927, **15**, 665.
3. Karan, A. A. *Ibid*, 1932, **26**, 571.
4. Morgan, R. *Ibid*, 1934, **29**, 577.
5. Pietsch, W. *Z. Tuberk.* 1939, **82**, 28.

built in a position which requires its own sewage treatment plant. In such a new building drains or part of them might be kept separate so that, whilst in ordinary circumstances they would be combined to pass through an orthodox purifying system, it would be practicable to divert some effluents to other treatment plant in which the full effects of anaerobic and aerobic treatment could be explored and the means for their effectiveness against pathogenic bacteria established.

London, S.E.1. J. H. OLIVER.

VARICOSE ULCERS

SIR,—As a "bad leg" doctor, I rejoice in the use of the term in your annotation of April 5. There is, however, little else of note to fire the enthusiasm of the surgeon or kindle the spark of epithelium upon the patient. This is a great pity, for your annotations rank with the special articles in the *Times*, exerting within their sphere a profound influence, as does gravity, upon informed medical opinion the world over.

It is thus doubly sad to see the patent misconceptions of a bygone era disinterred from the slag-heap of medical progress and revivified as modern ghouls. One of these dismal spectres declares that varicose ulcers can only be healed if the patient remains in bed, either at home or in hospital. This statement so belittles the achievements of both this and the last century, that it is hard to believe it is not a misprint. Surely by now we have all heard of ambulatory elastic adhesive compression, whereby the patient can continue full-time work whilst his ulcer heals. I have yet to see a *varicose* ulcer (and I have now seen enough to satisfy even the statisticians) which will not heal under this treatment, the patient pursuing his own occupation with maximal vigour—and yet we are told to put them to bed. What a waste of time and money, and what a waste of a bed! And what of our geriatric patients with varicose ulcers? Are we to keep them in bed and watch their ulcers healing whilst their joints stiffen? Fortunately this, too, is unnecessary, for with slight modifications, as befits the dignity of old age, the same technique will deal with the ulcer on an ambulatory outpatient basis.

I was disappointed, but not surprised, to see no references to any evidence in favour of the endocrine theory of causation of varicose veins so prominently featured in your annotation. This old surgeon's tale, handed on from consultant to houseman, has yet to be substantiated by concrete fact. I am at the moment engaged in an investigation into varicose veins in pregnancy which has proved to have some most interesting facets, not the least being that varicose veins *appearing for the first time* rarely declare themselves until the uterus is large enough to play a mechanical part in the production of venous engorgement of the lower limbs. As for the hitherto uncharted range of varicose peaks that you have opened up before us, such maps as I have in my possession, whilst showing the Everest of pregnancy give no indication of the Pyrénées of puberty nor the Matterhorn of the menopause; for although we see patients whose veins appear at these times, far from being a peak they are a valley.

I trust, Sir, that it was compositor's cunning, rather than editorial intention, that gave injection precedence over surgery in your list of efficient treatments; for despite the fascinating craze of the late '20s and early '30s follow-up studies have convinced most ardent sclerosers that injection, as a primary measure, is followed by a recurrence-rate of over 80%. Surgical measures, you may retort, are equally useless; and if you are referring to the usual surgical measures in the average hospital, I am with you heart and soul. For what happens to patients who present themselves for treatment? They state they have "veins"; they are asked to raise the trouser leg, or lift the skirt, just to ensure that their diagnosis is correct, and then they are placed on the waiting-list. When they are admitted, the standard blunderbuss procedure holding favour at the time of operation is carried out irrespective of the type of veins present; and not unnaturally the veins recur.

The most important, and the most neglected, aspect of the treatment of varicose veins is to examine the patient, classify the veins, and institute treatment appropriate to the type. I have tried[1] to set down clearly the simple basic principles upon which the examination is based, and I am delighted to say that this cry in the wilderness has been well received. You end by saying that the subject of varices is one on which some medical education of the public would be useful and constructive; I should prefer to see those who will carry out the treatment instructed first.

London, W.1. STANLEY RIVLIN.

SIR,—Your annotation suggests that patients with varicose ulcers do not take them seriously, but accept them fatalistically. I am convinced that these unfortunate people do take their ulcers seriously and are only fatalistic because they receive so little help from the medical profession.

The reasons for our impotence in the treatment of leg ulcers seem to lie in the failure to understand their fundamental cause. This point is illustrated by your annotation, which might well have been written between 1800 and 1867 when surgeons became obsessed with the importance of superficial varicose veins and John Gay's important monograph[2] had not been published.

Leg ulcers result from defective circulation in the lower limb. It has long been appreciated that the weight of the column of blood in the arteries counterbalances that in the veins, in whatever position the body may be. But in spite of this balance, and although there is a *vis a tergo* represented by the capillary pressure when the patient is lying prone, relay-pumping is required in the erect posture to maintain a satisfactory return of blood from the lower part of the legs. Harvey described how the movement of the limbs and contraction of their muscles squeezes the blood through the veins towards the heart. When the calf-muscles contract the venous blood is forced upwards into the iliofemoral veins and cannot flow back, when the muscles relax, on account of the valves in the veins, as Richard Wiseman appreciated in 1676.[3] Thus there is an efficient pump—the leg-muscle pump—helping to return blood from the lower limb during exercise.

The cause of leg ulcers is failure of the leg-muscle pump, though occasionally, as Gay realised, arterial disease may play a part. The leg-muscle pump may fail owing to blockage of the deep veins by thrombosis; by incompetence of the valves of the deep veins by dilatation; or by destruction of the valves from thrombosis and recanalisation. Lack of muscular contraction with prolonged standing in one position or with arthritis of the knees or ankles may also result in failure of this pump. Such failure causes increased capillary pressure in the leg with œdema, induration, and ulceration. Superficial varicose veins, unaccompanied by dilatation of the deep veins, do not cause failure of the leg-muscle pump and are never responsible for ulceration.

In a series of 750 patients with leg ulcers, examined personally, the cause of failure of the leg-muscle pump was venous thrombosis in 79%, and varicosity of deep veins in 7·6%; and in 10·4% the cause was doubtful. Arterial disease or arthritis accounted for the remainder.

In the prevention of leg ulcers the prevention of venous thrombosis is of paramount importance. Prevention of

1. Rivlin, S. The Treatment of Varicose Veins and their Complications. London, 1951.
2. Gay, J. On Varicose Diseases of the Lower Extremities. The Lettsomian Lectures of 1867. London, 1868.
3. Wiseman, R. Severall Chirurgicall Treatises. London, 1676.

ulcers does not depend, as your annotation states, on early and efficient treatment of varicose veins. When the leg-muscle pump has failed, from whatever cause, ulceration can be prevented if the œdema is controlled by elastic support.

Once ulceration has appeared, early treatment is important. The longer an ulcer remains untreated the more difficult is its cure. With the exception of ulcers of many years' duration, with much induration of the leg, which may require rest in bed, it is only necessary to abolish the œdema and the ulcer will heal.

Rest in bed has serious social and economic disadvantages for most patients and carries a risk of venous thrombosis and stiffening of the ankle-joint. The value of surgery in the treatment is still uncertain. Until a defective leg-muscle pump can be repaired control of œdema by compression and massage by Bisgaard's method offers the best chance of cure. Unless aftercare is adequate relapse is probable and permanent support by bandages or elastic stockings is required. As yet no surgical treatment can offer an alternative.

It is high time that we appreciated that treatment of superficial varicose veins is no answer to the problem of leg ulcers. Moreover, it is sometimes the cause of ulceration, as in 33 patients (4·4%) in my series in whom deep thrombosis followed injection of varicose veins, and in 10 patients in whom ulceration was precipitated by saphenous ligation. In another 49 patients ulceration became worse or appeared after such ligation.

Leeds. S. T. ANNING.

POSSIBLE DANGER WITH CYCLOPROPANE

SIR,—Safety First has long been the slogan of anæsthetists, and it is with this in mind that I would like to point out a danger from cyclopropane with the machines in use at most hospitals.

The rotometers of nitrous oxide, oxygen, and carbon dioxide are controlled by means of a screw-valve situated at their base, but in the case of cyclopropane this adjustment is affected by means of a circular key on top of the cylinder of cyclopropane on the side of the machine. A movement of as little as 1 cm. is sufficient to turn on the cyclopropane from 0 to 750 c.cm. per min.; and on many of the older cylinders this is achieved by the slightest touch.

A nurse or orderly brushing past the machine in the theatre, or during the transit from anæsthetic room to theatre, can quite easily turn this delicate control either off or full on. Especially dangerous is the fact that the gas is sometimes accidentally turned on when the anæsthetist has not intended its use, and when, therefore, his eyes will not be as often as usual on that rotometer, which is in any case much smaller than the others.

Conversations with anæsthetist colleagues have shown that these accidents are by no means rare, and in my opinion the provision of a guard round the cyclopropane key is not a sufficient safeguard. For absolute safety the cyclopropane rotometer should be provided with a separate screw-valve of its own.

West Hartlepool. FRANK R. RUSSELL.

CORONARY AND MYOCARDIAL DISEASE

SIR,—In your issue of April 12, Dr. W. P. D. Logan contrasts the mortality-rates in different social classes from "coronary" and "myocardial" diseases, and in the second paragraph he defines coronary disease as including angina pectoris, and myocardial disease as myocardial and cardiovascular degeneration. Unless I am mistaken these terms all refer to the same pathological entity—namely myocardial ischæmia due to coronary atherosclerosis.

The terms used are, of course, those of our colleagues who certified the cause of death. In the case of terms such as coronary atheroma, coronary thrombosis, or angina pectoris, the meaning is clear. In the case of myocardial or cardiovascular degeneration the exact meaning is rather vague; but I do not see that there is any other likely meaning than degeneration of the myocardium due to ischæmia produced by coronary disease. It might be argued that the two sets of terms refer to coronary thrombosis and to coronary atherosclerosis without thrombosis, but this is a distinction that is difficult if not impossible to make even at necropsy and certainly cannot be made clinically.

May I suggest that it would aid clearer thinking if we used the term "ischæmic heart-disease" for all cases where we mean that the heart has failed for lack of a proper blood-supply?

Department of Pathology,
Postgraduate Medical School of London, W.12. C. V. HARRISON.

RADIOLOGICAL INVESTIGATION

SIR,—I was very pleased to see that Dr. Peter Leggat (April 19) had given such prominence to my statement: "The fact that young adults die from undiagnosed pulmonary tuberculosis is not due to failure to radiograph them, but to bad clinical examination." The statement is based on many years' experience with sound clinicians, and on such evidence as I have previously recorded of young soldiers. These men's chest complaints were dismissed by their medical officers (not old medical practitioners); but when they went home on leave their non-medical parents recognised the disease and took them to the family doctor, who supported the diagnosis and had it confirmed by radiography or sputum examination. No mass radiography of soldiers will prevent this: bad clinical work is usually associated with bad radiology.

I have repeatedly examined patients sent by general practitioners who rightly detected the early signs and symptoms of tuberculosis, though I could find no signs of it at the first examination, or only minimal signs. (And when I say minimal I mean less radiographic evidence than some "mass workers" record under that term; for they include not only old lesions but such as sometimes vanish within a few weeks without any treatment. I have seen that lobectomy has been performed on such within a few days of discovery. What a remarkable "advance" in the treatment of tuberculosis, and what clinicians!)

I am not at all surprised to note that in a recent survey on minimal pulmonary tuberculosis Dr. Leggat discovered that "in over 60% of the cases there were no symptoms and in over 70% there were no signs." I should have expected his figures to be nearer 100%. I have seen some patients, who because of their suspicious signs were referred by general practitioners to the chest expert, returned as normal; yet the parents were convinced that the disease was present, and I have established the diagnosis. When he does not observe the early radiographic signs, the "expert" sometimes becomes blind to the clinical evidence detected by the detor, patient, and parents.

If Dr. Leggat examines the figures of the Birmingham mass-radiography unit recorded by Dr. Halliday Sutherland,[1] he will see that of the 157 cases of tuberculosis detected, 125 were found to have tubercle bacilli in the sputum. As regards the other 32 cases, it remains to be proved that the disease was active and that, undiscovered by radiography, they would not have healed without any treatment or knowledge of the disease, as the greater majority of lesions do. Further, these examinations, though conducted with a mass-radiography unit, did not constitute mass radiography but an essential part of a clinical examination which general practitioners sought for patients in whom they had found signs—a very proper, reasonable, and economical method which was suggested by a radiologist[2] who has strongly criticised mass radiography from its inception.

1. *Lancet*, Jan. 19, 1952, p. 152.
2. Brailsford, J. F. *Med. World, Lond.* March 31, 1934.

With Dr. Leggat's concluding remark "but the ultimate responsibility in regard to treatment lies with the clinician" I fully agree. If that responsibility was forced home on all those who call themselves clinicians we should see fewer patients who had no signs and symptoms before radiography, but now, after treatment, have more signs and symptoms than is reasonable or justifiable.

Birmingham. JAMES F. BRAILSFORD.

THE DENTISTS BILL

SIR,—Mr. Roper-Hall's letter arguing against the proposal in the Dentists Bill to carry out an experiment in the training and employment of dental ancillaries, and criticising your leading article of March 29, was surprising; for its author was a member of the United Kingdom Mission which went out to New Zealand in 1950 to study the operation of the school dental service there. The New Zealand service has depended for the last thirty years upon the use of school dental nurses such as it is now proposed to employ for an experimental period in this country. The group of eminent dentists who comprised the mission were unanimous and cordial in their appreciation of the functioning of the service, of the value of the school dental nurse as an educator in oral health, and of the quality of her work. The proposals of the Dentists Bill are a consequence of their unanimously favourable report. One wonders why, at this late stage, Mr. Roper-Hall has come to the conclusion that the New Zealand experience is irrelevant to the grave crisis affecting the school dental service here. He can hardly entertain illusions as to the seriousness of this crisis, nor believe it to be less acute or in some way less permanent than that facing the health authorities in New Zealand thirty years ago.

The service has never at any time been able to recruit more than a fraction of the dentists it needed to provide adequate treatment—a state of affairs which remained largely unnoticed until, with the inception of the National Health Service, numbers of the already totally inadequate personnel were attracted away from the service to lucrative private practice. The over-all shortage of dentists and the understandable reluctance of all but a minority of them to undertake the exacting and repetitive tasks of routine children's dentisty will only be offset when ancillary workers are trained to perform the simpler of these routine tasks under the direct supervision of a qualified children's dentist, who would plan the treatment for each child, delegate to the dental nurse that part of the treatment she has been trained to perform, supervise her work, and do the more complicated operations himself. Teams of a dental officer and five or six dental nurses could in this way really begin to offer an acceptable service to the children under their care, making the most economical use of available skill. As a dentist who has already spent too many years in a discouraging struggle against dental decay in children, and conscious of having made no real impression on the problem of their dental health, I not only welcome the Dentists Bill but believe firmly that only by enlisting the help of ancillaries shall we ever be able to build up a children's dental service of which the country can be proud.

Mr. H. W. Breese (April 12) wonders why it should be necessary for a qualified dentist to supervise the work of the dental ancillaries, since the latter would be specialists in the limited field of children's dentistry. In fact, they would be specialists in the filling and extraction of children's teeth only, which I am sure your correspondent would agree is by no means the whole field of children's dentistry. Unfortunately, under present conditions, the school dentist has little time for anything but this limited routine work, so great is the pressure upon him. The children's dentist in charge of a team of ancillaries would supply the medical knowledge which had been deliberately excluded from the dental nurse's training. Relieved of much of the routine work, which an ancillary trained specifically for the purpose could perform equally well and at much less cost, the dental surgeon would be enabled to give the benefit of his wider knowledge to many more children than he can ever hope to reach at the present moment.

Any realistic discussion of the economic aspects of this problem cannot ignore this factor. It can hardly be overemphasised that the present system, in which school dentists, after an expensive training of five years spent acquiring a background of medical knowledge and an introduction to the whole range of dental techniques, are obliged to spend their time on simple routine tasks, so repetitive as soon to blunt the edge of enthusiasm, and given little opportunity to exercise their medical knowledge, is appallingly wasteful. It is the kind of gross waste of skill and knowledge that goes too often unrecognised but which is none the less quite inexcusable. It can only be avoided by passing the routine work to ancillary workers, as is the universal practice in the wider field of medicine.

SENIOR SCHOOL DENTAL SURGEON.

Medicine and the Law

Error in Blood-Transfusion

SOME vigorous comments were made at a recent inquest in York where a patient had died in hospital after an error in blood-transfusion.[1] The coroner spoke of everything having gone wrong that could go wrong on that particular day. The mistake was apparently made at 4.30 P.M. when the theatre nurses went to tea and were replaced by others. A nurse, he said, went into the theatre not knowing the name of the patient; before she had time to speak to the nurse from whom she was taking over, she was sent for blood. She went to the laboratory not knowing for whose blood she was going. A doctor opened the refrigerator and pointed to a bottle. The bottle was not checked and the wrong bottle was taken. The blood was of the wrong group.

Such a mistake, said the coroner, could be avoided. The blood-bank could be divided into proper groups with separate compartments for blood to be used that day and a special compartment with the patient's name for blood needed for a particular patient's operation.

Recording a verdict of death by misadventure, the coroner stated that he had not summoned a jury because no person showed negligence of such a high degree of culpability that the issue should be left to a jury to decide. It had been distasteful to him to put questions to eminent professional men in a way which suggested that they might have been at fault. "Everyone," he said, "has the greatest sympathy with them, but at the same time the rewards for professional service are such that a very high degree of capability and skill is required of them."

Barbiturates in Bulk

The dangers of patients being given liberal supplies of barbiturates, to which we have lately drawn attention,[2] were unhappily illustrated by two cases of suicide from phenobarbitone with which the Manchester city coroner dealt on April 9.[3]

Both suicides were men of about fifty who had been given a fortnight's supply of the drug; one had been prescribed 72 tablets some ten days before his death and was found unconscious with only 4 tablets left. Giving evidence at the inquest, a doctor said that in hospital it was usual to give phenobarbitone only under strict

1. *Yorkshire Post*, April 10.
2. Annotation, *Lancet*, Feb. 23, 1952, p. 406.
3. See *Manchester Guardian*, April 10, 1952.

supervision. He suggested that for outpatients it might be better to hand the tablets to some responsible relative.

There is bound to be some risk when potentially dangerous drugs are taken home by suicidally disposed patients, but it is one which every doctor who prescribes barbiturates should constantly bear in mind. Even small doses may be hoarded by a patient bent on suicide; and here the only safeguard lies in alertness for signs of mental depression,[4] so that we do not attempt to palliate a serious condition by drugs which may present a fatal temptation to the patient.

Public Health

World Incidence of Poliomyelitis in 1951

THE World Health Organisation has added another report [5] to the valuable series dealing with the incidence of poliomyelitis throughout the world since the war.[6] This latest report deals with incidence during the year 1951 and with certain epidemiological features which seem to have been more in evidence since the war than before it.

In Europe incidence was, on the whole, lower in 1951 than in 1950; but Italy, Norway, the Netherlands, and Switzerland reported more cases than in 1950. Unfortunately no information is available about incidence in Albania, Bulgaria, Czechoslovakia, Hungary, Poland, Rumania, the Soviet Occupation Zone of Germany, or the U.S.S.R. In Italy the number of reported cases—2870—was larger than in any of the previous fifteen years except 1939 (6007). In Norway 1553 paralytic cases and 663 non-paralytic cases were reported. These were the highest figures for thirty-two years except 1941 (1793 paralytic). In the Netherlands more cases (568, mainly paralytic) were recorded than in the previous three years together (308). Incidence was, however, a little lower than in the previous bad years—1930, 1938, 1943, 1944, and 1947. In Switzerland 889 cases were reported—a high incidence, but one which was exceeded in 1936, 1937, 1941, 1944, and 1946.

In the United States incidence was lower than in 1949 or 1950, while in Canada it was higher than in 1948 and 1950 but lower than in the other post-war years. In Mexico 1951 was the year of highest incidence since 1937.

Australia has suffered severely from poliomyelitis in recent years, and in 1951 notifications exceeded those of 1938 and 1950, which had been the years of highest incidence since 1924. In Oceania there were several scattered outbreaks—in the Solomon Islands, in Papua, in Dutch New Guinea, and in Tahiti. New Zealand had relatively few cases, in contrast to the experience of the years 1948–50.

In 1951 incidence was high in the Belgian Congo, in French Equatorial Africa, and in Angola. It is difficult to be sure whether these high reported incidences are due, in some measure, to better ascertainment; but the author is disposed to think that there has been a true increase.

Information about incidence in tropical countries is necessarily less complete than for Western countries, but a good deal of evidence is accumulating to show that some of the traditional generalisations about the epidemiology of poliomyelitis—e.g., that it is a disease of temperate climates with a high incidence in summer—may need drastic revision. The generalisation that epidemics arise at a definite season seems to be more true of countries with cold or temperate climates than of hot countries; but a good many winter epidemics have been recorded, and as far back as 1917 Leake et al.[7] collected some thirty examples. The report mentions the recent winter epidemics in Malta in 1942–43 and 1945–46 and in Iceland in 1946–47 and 1948–49, and the outbreak of 1948–49 among Eskimos living to the West of Hudson Bay.[8]

4. See Annotation, *Lancet*, 1951, ii, 1026.
5. Freyche, M. J. *Epidem. vital Statist. Rep.* 1952, **5**, 145.
6. Stowman, K. *Ibid*, 1947, **1**, 114. Freyche, M. J. *Ibid*, 1950, **3**, 3. Freyche, M. J. *Ibid*, 1951, **4**, 3.
7. Leake, J. O., Bolten, J., Smith, H. F. *Publ. Hlth. Rep., Wash.* 1917, **32**, 995.
8. Peart, A. F. W. *Canad. J. publ. Hlth*, 1949, **40**, 405.

Vital Statistics for 1951

The Registrar-General [1] reports provisionally that in 1951 the birth-rate was 15·5 per 1000 home population; this rate was 0·3 below that for 1950. The provisional stillbirth-rate was 22·9 per 1000 total live and still births, compared with 22·7 in 1950. The death-rate was 12·5 per 1000 home population; this was 0·9 above that for 1950. Infant mortality was 29·6 per 1000 related live births, and was the lowest ever recorded in this country. The effective reproduction rate corresponding to the births in 1951, after making allowance for continuing improvement in survivorship conditions, is provisionally assessed at 0·97, indicating that births in 1951 were 3% below those required for a par replacement standard.

The Registrar-General also gives the following abridged life table, constructed from the estimated home population and total deaths in 1950:

Age x	Males		Females	
	A	B	A	B
0	10,000	66·49	10,000	71·22
1	9663	67·80	9740	72·11
2	9641	66·95	9718	71·28
3	9626	66·06	9706	70·36
4	9617	65·12	9697	69·43
5	9608	64·18	9689	68·49
10	9572	59·41	9664	63·66
15	9546	54·57	9645	58·78
20	9497	49·83	9607	54·00
25	9431	45·17	9554	49·29
30	9355	40·51	9489	44·61
35	9273	35·85	9416	39·93
40	9166	31·24	9324	35·30
45	9006	26·75	9201	30·74
50	8722	22·54	9005	26·35
55	8277	18·62	8722	22·13
60	7585	15·09	8307	17·11
65	6582	12·00	7676	14·39
70	5297	9·31	6729	11·07
75	3786	7·03	5359	8·26
80	2215	5·24	3584	6·11
85	939	3·95	1830	4·56

A = the numbers who would survive to exact age x out of 10,000 born who were subjected throughout their lives to the death probabilities indicated by the 1950 death records. B = the "expectation of life"—that is, the average future lifetime of someone exactly x years of age, if likewise subject to these death probabilities.

Revised Regulations for Notification of Tuberculosis

The Public Health (Tuberculosis) Regulations, 1952, which come into operation on May 1, replace those which have been in force since 1930. There will be no change so far as a notifying practitioner is concerned, but a medical officer of health will no longer be required to keep a register of notifications, though he will doubtless continue to do so for his own purposes. It will no longer be legally necessary to provide information about a tuberculous patient entering or leaving a sanatorium or hospital, but the Minister has asked hospital boards and committees to ensure that this information is sent by the institution concerned to the medical officer of health of the district in which the patient lives.

Coöperation in Care of the Tuberculous

In a circular to hospital authorities (R.H.B.[52]39), the Ministry of Health refers to "lack of coöperation between chest clinics and Local Health Authorities which is impeding the Authorities in carrying out their responsibilities" for the prevention of tuberculosis and the care and aftercare of the tuberculous.

"It appears that, in particular, difficulty has been experienced by some Medical Officers of Health of Local Health Authorities in obtaining from Chest Physicians in charge of clinics the information required for the Authority's purposes contained in chest clinic registers or other case-records."

1. Registrar-General's Quarterly Return for England and Wales: Quarter ended Dec. 31, 1951. H.M. Stationery Office. Pp. 40. 2*s*. 6*d*.

"It has also been represented to the Minister," the circular continues, "that not all chest physicians are sufficiently concerning themselves in the preventive and after-care aspects of tuberculosis work."

Finally the circular recalls that the medical officer of health should be informed when patients with notifiable diseases, including tuberculosis, are admitted to, or discharged from, a sanatorium or hospital.

Variola Minor in South-east Lancashire

In the week ended April 19 notifications of variola minor in England numbered 2—one at Littleborough, a district already involved, and the other at Middleton, a borough close to Rochdale at which there has been no previous case. This patient sickened on April 13–14 and was removed to a smallpox hospital on April 17. Secondary spread is not expected.

The case notified from Wardle in the week ended April 12 was not smallpox. For the first time in nine weeks there were no notifications from Rochdale. Contacts are still under surveillance at Rochdale, Littleborough, and Middleton; but it seems possible that the outbreak has been contained. Notifications this year total 138.

At an inquest in Rochdale on April 14,[1] the coroner returned a verdict of death by misadventure in the case of a man, aged 26, who had died of encephalomyelitis twelve days after vaccination. According to medical evidence, 17,000 people had been vaccinated with the same batch of lymph without mishap.

Obituary

GEOFFREY BALMANNO FLEMING

M.B.E., M.D. Camb., LL.D. Glasg., F.R.C.P., F.R.F.P.S.

Dr. G. B. Fleming, emeritus professor of medical pædiatrics in the University of Glasgow, died on April 16 at the age of 69. His grandfather, who qualified in medicine in 1830, and his father were both surgeons at the Royal Infirmary, and his death thus brings to a close a span of three generations of his family who had practised in Glasgow.

He was educated at Haileybury, King's College, Cambridge, and Glasgow University. After taking his M.B. Camb. in 1910, he held resident posts in the Western Infirmary and Ruchill Fever Hospital in Glasgow. Later he spent some time in postgraduate study in Vienna, before he became assistant to the professor of medicine at Anderson's College, Glasgow. During the first world war he served in East Africa, with the rank of lieut.-colonel, and for his services he was appointed M.B.E. and mentioned in despatches. On his return to civilian life he became interested in pædiatrics and for 35 years he served on the staff of the Glasgow Royal Hospital for Sick Children at Yorkhill. In 1930 he succeeded Leonard Findlay in the chair of medical pædiatrics in the university. Under his guidance pædiatrics assumed a new importance for the medical student. A few years before his appointment tuition had been made compulsory, but largely by his efforts the time allotted to teaching was increased, and in 1935 pædiatrics became a part of the final examination in medicine.

During the '20s Fleming published important papers on basal metabolism and caloric requirements in infancy, and he earned an enviable reputation both at home and abroad. In his later years he became active in administration and committee work. In 1946 he was president of the British Pædiatric Association, and the same year he was elected to the presidency of the Royal Faculty of Physicians and Surgeons which his father had also held. He retired from his chair in 1947, and the same year under by-law xxxix(b) he was elected to the fellowship of the Royal College of Physicians of London.

"All who knew Fleming," writes S. G., "were impressed by his integrity and honesty. To work with him was to grow fond of him. He had an inborn courtesy which belonged to an earlier age and he was never heard to speak ill of anyone. He had many outside interests: he was a good shot and a good fisherman, and he played golf regularly. He loved, perhaps best of all, the company of congenial friends, when with good food and wine and engaging conversation he would radiate good cheer. Since last September he had faced ill health with simple faith and courage."

S. A. writes of the Dickensian quality of Fleming's appearance and personality. "The cut of his clothes, the festooned watch-chain, the oval lenses of his gold spectacles all helped to bring into sharper focus a picture of the traditional professor. Slight in build yet elegantly proportioned, he gave an impression of frailty, but his noble brow and benign expression provided reassuring testimony of health and mental alertness. These physical characteristics matured in the seventh decade of life, and his presence added an old-world charm to the precincts of hospital and university. They were seen to best advantage when after an informal dinner he indulged in the exquisite pleasure of proposing a toast. Wit and wisdom, nicely blended, flowed gently forth upon his delighted guests, who were till then rarely aware of the dialectic skill and resourcefulness of this diminutive and rather self-effacing physician.

"Naturally gentle and wont to show infinite consideration for the susceptibilities of others, he prided himself not so much on his attainments as on the honour of being a custodian of great traditions. Many of his apparently impromptu pronouncements on policy were in fact carefully prepared statements. He was by nature a thoughtful man; and he did not shrink from giving much of his leisure to the close examination of the changing circumstances of the practice of medicine. His memoranda were remarkable for comprehensiveness, a sense of reality, and excellent judgment. If he was generous of his time and energy, he was not less so with his material resources. He had inherited a large fortune and he elected not to take part in private practice. Both the university and the Royal Faculty have benefited from his munificence.

"He may not have shown great urgency in the pursuit of research; but his investigations on basal metabolism brought him recognition as an original worker. Moreover, he recognised the importance of investigation in maintaining freshness of outlook among the staff of a teaching hospital; and he did everything in his power to help young physicians and surgeons of his unit who had an aptitude for inquiry. He was, however, more than content to regard himself as essentially a practitioner-teacher, devoted to his young patients and anxious to expound to his students the practical approach of the competent family doctor. He will be remembered as a capable physician of the old school—shrewd and conscientious, gracious in manner, and generous to a fault. The Glasgow medical school has reason to be grateful to him for much unostentatious service performed with dignity and kindliness."

JOHN STROUD HOSFORD

F.R.C.S.E.

Mr. J. Stroud Hosford, consulting ophthalmic surgeon to the Royal Eye Hospital, London, died at Bexhill on April 10.

Born in 1872, he received his medical education at University College Hospital, London, where he qualified in 1895, and in 1904 he took the fellowship of the Royal College of Surgeons of Edinburgh. He also studied in Paris, Wiesbaden, and Vienna. Besides his appointment on the staff of the Royal Eye Hospital he had been dean of its medical school, and he was for many years surgeon to the London Temperance Hospital. His other appointments included those of ophthalmic surgeon to the Michie Military Hospital, Kensington, and to the Government medical board, Camberwell. He published papers on cerebellar tumour with proptosis, on the diagnosis of disease of the orbit, and on cataract.

C. writes: "Stroud Hosford had many interests besides ophthalmology. In his younger days he was fond of cycling, and almost every weekend he took his bicycle into Sussex where he studied, particularly, bird-life. He was keenly interested in astronomy, for the pursuit of which he had a small observatory built in his garden to house his 6 in. telescope. On one occasion he thought he had discovered a new star and telegraphed its position to the Astronomer Royal,

1. *Manchester Guardian*, April 15.

who wired back that although the star was not a new one, to have seen it showed nevertheless fine powers of observation. After an illness in his early twenties Hosford was advised to take a sea trip, and as a surgeon in the P. & O. Company he visited India, China, and Japan. This voyage besides being beneficial to his health was of such interest that he later made another during which he met a learned Siamese doctor who was the means of consolidating and enlarging Hosford's interest, already formed, in Oriental philosophy, especially Buddhism. From then onwards till the end of his life his knowledge and understanding of this vast subject grew deeper, and in the course of years he formed what must be one of the finest collections of books on this subject in private hands."

Appointments

FERGUSON, T. B., M.B. Glasg., D.P.H. : appointed to the staff of the regional M.O., Scottish region of British Railways, Glasgow.
HORTON, E. H., M.B., B.SC. Wales, T.D.D. : deputy medical superintendent (S.H.M.O.), Glan Ely Hospital, Cardiff.
MACLEOD, J. R., M.B. Leeds, M.RAD. Lpool, D.M.R.T. : consultant radiotherapist, United Leeds Hospitals.
MACQUEEN, I. A. G., M.D. Edin., D.P.H. : M.O.H., City of Aberdeen.
MALLENDER, LILIAN, M.B. Leeds, D.M.R.T. : asst. radiotherapist (S.H.M.O.), United Leeds Hospitals.
MINTO, W. H. P., M.B. Aberd., D.P.H. : M.O. on the staff of the County Council of Cornwall, asst. school M.O. and M.O.H., Area VI, Cornwall.
RYAN, O. P. D., M.B. N.U.I., M.R.C.P.I. : joint physician for the counties of Sligo, Leitrim, and Donegal.

Colonial Service

BEHAN, T. G., L.R.C.P.I. : M.O., Uganda.
BENNETT, J. P., M.B. Durh. : M.O., Federation of Malaya.
CATHRO, A. J. McG., M.B. St. And. : M.O., Kenya.
CHEN, J. H., M.B. Hong-Kong, F.R.C.S. : M.O., Hong-Kong.
COOPER, P. R., M.B., D.T.M. : regional senior health officer, Nigeria.
DAVEY, T. F., O.B.E., M.D., M.SC. Manc. : leprosy adviser, Nigeria.
ELLIS-JONES, D. W., M.B. Lpool, D.O.M.S. : ophthalmic specialist, Tanganyika.
FEANNY, LLOYD, M.D. Dalhousie : M.O., Sarawak.
FORBES-WINSLOW, V. F., M.R.C.S., D.P.H. : regional senior health officer, Nigeria.
GOLLEDGE, A. H., M.R.C.S. : port health officer, Aden.
KINSELLA, F. J. G., L.R.C.P.E. : M.O., Somaliland Protectorate.
MITCHELL, R. M., M.B. Glasg., F.R.F.P.S. : special-grade M.O., Nyasaland.
MOORE, WILLIAM, M.B. Belf. : M.O., Uganda.
PEACOCK, J. G., M.R.C.S., D.A. : special-grade M.O., Tanganyika.
SEALE, W. B., M.B. Dubl. : M.O., Uganda.
SEXTON, J. P., M.B. Edin. : regional senior health officer, Nigeria.
SINHA, A. C., L.M.S. Singapore, M.R.C.O.G. : specialist officer, Federation of Malaya.
SLATTERY, M. F. X., M.D. Dubl. : M.O., Federation of Malaya.

Liverpool Regional Hospital Board :

BROWN, D. P., M.B. Glasg., D.A. : part-time consultant anæsthetist to hospitals in the Southport and Ormskirk groups.
DOWNHAM, E. T., M.B. Lpool, D.P.M. : whole-time asst. psychiatrist, Walton Hospital.
FOODY, J. T., M.B. N.U.I. : whole-time senior M.O., Barrowmore Hospital.
HUGHES, GOUGH, M.B. Lpool, D.A. : part-time consultant anæsthetist to hospitals in the Central Wirral and Chester groups.
MOORE, JOHN, B.A., M.B. Dubl., D.A. : part-time anæsthetist to hospitals in Liverpool.
MURPHY, A. F., M.CH. Lpool, F.R.C.S. : whole-time consultant general surgeon to hospitals in the North Liverpool group.
RICKHAM, P. P., M.S. Lond., F.R.C.S., D.C.H. : consultant pædiatric surgeon, Alder Hey Children's Hospital.
SKENE, ALEXANDER, M.B.E., M.B. Edin., M.R.C.P. : whole-time consultant physician-superintendent, Walton Hospital.

The Hospital for Sick Children, Great Ormond Street, London :

HUGH-JONES, KENNETH, M.D. Lond., M.R.C.P. : house-physician.
O'DONNELL, M. B. N. J., F.R.C.S. : house-surgeon.
PATTERSON, T. J. S., M.B. Camb., F.R.C.S. : part-time registrar, plastic department.
ROBERTS, A. P., M.B. Lond., M.R.C.P., D.C.H. : house-physician.

University College Hospital of the West Indies :

BUNJÉ, H. W., M.D. Lond., M.R.C.P. : registrar.
DEGAZON, D. W., M.B. Lond., F.R.C.S.E., D.O.M.S. : consultant specialist in ophthalmology.
JACOBSON, F. W., M.D. Berlin, L.R.C.P.E. : consultant specialist in dermatology.
JAMES, OLIVER, M.D. Lond : registrar.
KEATING, V. J., M.B. N.U.I., lieut.-colonel R.A.M.C. : anæsthetist.
ROSS, H. J., M.B. Aberd., F.R.C.S. : registrar.
STUART, K. L., M.B. Belf. : registrar.
SUGAR, MAX, M.D. : consultant specialist in dermatology.

The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.

Notes and News

NEW MEDICAL RELIEF PLANS

AN international conference on rehabilitation, held under the auspices of the World Veterans' Federation, opened in Paris on April 16. Delegates considered how modern methods of reablement could be extended for the benefit of disabled people in all countries.

Dr. Harold Balme, chairman of the United Nations working party on rehabilitation, said in his opening address that the fitting of artificial limbs was unsatisfactory in many countries, and he urged governments to take control of the manufacture of artificial limbs to ensure that every limbless person got the right kind of prosthesis. The conference approved a plan for courses of instruction for orthopædic surgeons and limb-fitters and other technicians to be held at the Ministry of Pensions hospital at Roehampton.

Speaking during the session on the reablement of ex-Servicemen, Dr. Ludwig Guttmann, director of the spinal injuries centre at Stoke Mandeville, described the success achieved with new methods of treatment in such injuries. Patients whose lives had seemed hopeless were being helped to take their places as productive members of society.

A programme of international aid for disabled ex-Servicemen, sponsored jointly by the federation and the Coöperative for American Remittances to Europe (CARE), was officially launched at the conference.

Medical relief to the distressed areas of Asia and elsewhere will be accelerated by the agreement just concluded between CARE and the World Health Organisation. W.H.O. cannot buy expensive supplies for medical institutions, and the progress of its work has been repeatedly held up by lack of equipment and beds in hospitals and clinics. CARE will now enlist American public support to meet the most urgent needs and send the equipment to the places recommended by W.H.O. By this means iron-lung "banks" will be set up in Tokyo, Bangkok, and a place to be selected in the Middle East, and 15,000 kits for midwives will go to India and South-East Asia.

HEBERDEN ROUND

THE Heberden Round was conducted by Sir Henry Cohen, president of the Heberden Society and professor of medicine in the University of Liverpool, at the Royal Infirmary, Liverpool, on April 18. Cases of the diffuse collagen diseases, which had been under investigation with cortisone and A.C.T.H., were demonstrated.

Four patients with disseminated lupus erythematosus had shown general improvement with A.C.T.H., but in at least one case the histology had remained unchanged. Dermatomyositis in a child was being controlled by a small dose of A.C.T.H. every few days. She had quickly relapsed after attempts to substitute cortisone to avoid injections. A woman with Sjögren's syndrome, including swollen and painful parotid glands, granulopenia, arthritis, and hepatitis, had responded satisfactorily to A.C.T.H., and her hepatic function had improved. A patient with temporal arteritis (proved by biopsy) had been given A.C.T.H., and intense bilateral headache was relieved.

Sir Henry Cohen later entertained members of the society to dinner at the Staff House of the University of Liverpool.

IRISH INTERNS

WHEN the compulsory intern year is introduced, as it may be next year, deans throughout the country will be working out sums involving x final-year students and y resident jobs. If x is greater than y, what is the answer? Dr. R. A. Stoney, president of the Irish Medical Registration Council, and the Council's intern committee have been trying their hand at this piece of mathematics as it applies in Eire.[1] A Bill has been passed by the Dáil and the Senate which corresponds closely to the clauses about interns in the Medical Act which Parliament passed in 1950. It is expected that the appointed day will be Jan. 1, 1953, and that 330–340 medical students will qualify in Eire in the year following. But the best estimates of available internships show that there will be 60–70 new doctors without jobs. Foreigners, Dr. Stoney thinks, might reasonably be expected to go home for their postgraduate year, since they will probably return home to practise anyway. If only half of them did so in 1953 the deficit would fall to the more manageable figure of

1. *Irish J. med. Sci.* April, 1952, p. 174.

20 or so. And these, he suggests, can find employment in England where the provisional figures for 1953 indicate a surplus of 200 posts.

The difficulty of numbers does not seem therefore to be a formidable one, but Dr. Stoney is also concerned about money. The Irish intern will get £150 a year and his keep, and the hospitals will have to find not less than £50,000 every year to meet the increase in salaries of resident doctors. There is as yet no definite plan about where this is to come from.

AUTOMATIC PROCESSING OF X-RAY FILMS

A UNIT for the automatic processing of X-ray films, a prototype of which has been in use for some time in the department of diagnostic radiology at Guy's Hospital, is now being manufactured.[1] Its purpose is to ensure standard dark-room conditions as free as possible from human error. The dark-room technician has only to unload the cassette, fix the film in a hanger, and place it in the developing tank; the rest follows automatically. The hanger starts from a fixed point in the tank and is carried along by two moving belts on each side. Its speed is such that it reaches the end of the tank after the proper time of 5 minutes. It then touches a microswitch which operates a lifting arm driven by compressed air. The hanger is carried over to the fixing tank and on the way passes through a spray of water instead of the usual rinsing tank. Having deposited its load in the fixer, the arm returns in readiness for the next film. The moving belts take up the hanger again and carry it through the fixing tank. Another lifting device then removes it, carries it over a light trap, and sends it on its way through the final washing tank which is outside the dark room.

Each morning the developer is suitably replenished according to the number of films processed the day before, as recorded by an automatic counter. A replenishing technique has been devised which ensures a satisfactory chemical consistency for at least 12 months without emptying the tank. Temperature control is provided which is adequate for cold and temperate climates, but a refrigeration unit can be added for tropical use. Thus the time, temperature, and chemistry of development are very closely regulated.

The unit at Guy's, originally experimental, is now an established feature of the department. It enables a high standard of radiography to be more easily maintained and it saves time and materials.

University of Bristol

At a recent examination for part II of the diploma in medical radiodiagnosis the following were successful:

D. C. R. Burrows, W. A. Copland, Lien Chuan Yew.

United Sheffield Hospitals

At the third annual general meeting of the United Sheffield Hospitals, held on April 17, Sir Cecil Wakeley, F.R.C.S., was the guest speaker, following Sir Ernest Rock Carling and Lord Moran who addressed the two previous meetings. Applications for seats exceeded those available in the City Hall. Mr. Albert Ballard, chairman of the board of governors, presenting the annual report, spoke of the factors that have restricted hospital progress under the National Health Service—including competition for building materials, international economic crises, and rearmament.

"Fourthly," he said, "we were operating a new Act of Parliament which in the case of the teaching hospitals was in danger of breaking an age-long tradition of voluntary service and which was to be coördinated and supervised by a Civil Service not too familiar with those traditions and in some cases antagonistic to the methods."

Nevertheless remarkable progress had been made in various ways, and the United Sheffield Hospitals last year treated 25,600 in their wards—an increase of 2780 over 1947. He concluded his review by saying:

"Every social advance in this country expressed in an Act of Parliament begins as a compromise; is the result of debate and controversy, a concession here and an improvement there. Then in actual operation it is again criticised, again adapted to suit the area, period, or other circumstances. Never stereotyped, never ideal, never really logical. Therefore I am led to believe that our love of freedom, our tradition of tolerance, our insistence on variety, will save our great teaching hospitals from becoming merely Government departments so long as we continue to tap the immeasurable resources of good will, voluntary service, and idealism that have hitherto inspired us."

1. The manufacturers are Nucleonic and Radiological Developments Ltd., 22, Marshgate Lane, London, E.15.

Royal College of Obstetricians and Gynæcologists

At a recent examination for the diploma in obstetrics the following were successful:

K. I'A. Alexander, A. C. Anderson, Elizabeth J. F. Anderson, Patricia Arnold, Herman Aufrichtig, H. M. Baird, John Barr, B. G. J. Barrett, M. M. Baskin, Arthur Bates, Margaret E. Beynon, J. P. Bingle, H. C. H. Bird, Margaret C. Black, Dorothy J. Blake, Olga Bolitho, John Breeze, V. R. Bruce, Peter Bryan-Brown, J. L. Butler, L. S. Calvert, D. M. Cameron, D. S. H. Cannon, Jack Cantor, E. F. Cassar, G. G. Champion, Shakuntla Prem Chandra, Gopal Vasudeo Chaphekar, Thin Mann Chin, J. M. Clarke, Gerald Clayton, A. W. Cook, Patricia B. Corston, Margaret J. Croall, H. E. Crosskey, D. M. Curtis, C. J. Davis, Esther M. Davis, Marie T. D'Netto, E. J. Fairlie, J. R. C. Flett, Agnes A. Flewett, T. S. Forsyth, William Fullerton, J. A. J. Geaghan, R. H. Gelb, G. L. Gleeson, Charles Gold, Ruth Y. Golder, John Gower, B. P. Green, A. C. Griffith, Brenda M. Grimmett, G. R. S. Grogono, Margaret E. Hall, Antoinette I. Hallett, R. P. C. Handfield-Jones, Geoffrey Hands, R. G. Hendrey, Muriel S. Hill, Ferdinand Hillman, Charles Hodes, M. McA. Holmes, M. F. Holt, P. T. Howse, Alexander Hunter, Nayma Hussain, A. F. M. Nural Islam, G. A. Jamieson, Nafra A. F. Johnston, A. J. Keane, Herbert Keidan, Aziz Ahmed Khattab, Malati Rajaram Khot, Alexander Kilpatrick, D. M. D. King, R. V. Knight, R. G. Krause, Satyendu Kumar Kundu, Anne M. Legge, Martin Lesser, G. P. Love, Alicja A. Lubicz-Sawicka, R. W. Lyle, Alexander Macdonald, A. D. Macdonald, Mary E. McGavin, R. A. McGregor, Patricia C. Mackay, W. T. Mackie, A. G. McKnight, Sheila C. McNally, Sushil Mallick, Lorna D. Malloch, Margaret B. Malloch, Peter Manolis, J. P. Masterton, Leela Menon, M. C. Michelow, Marion C. Miller, William Moore, A. D. Muirhead, P. H. Mulhern, G. J. Pack, Dharmarau Patnaik, A. B. L. Peake, J. K. P. Perera, Joan K. Perkins, B. W. Petty, D. L. Phillips, Margaret Pugh, Dulcie G. Rayment, Alison M. Richardson, E. J. E. Roche-Kelly, G. J. Rockley, Esmé S. Rogers, Irene H. Rogers, J. H. Ross, Anthony Ryle, J. R. Saunders, Audrey Seddon, Zubaida Khatoon Shaikh, H. G. I. Shanks, Kusum Kumari Sharma, J. B. Smith, M. H. Southall, J. T. Spenser, I. W. Stoddart, Evelyn Swangren, R. T. Swinburn, Frank Taylor, P. R. Thompson, Anne G. Tighe, Sushila Prabhaker Udani, W. H. Watson, Sheila M. Watts, N. W. F. Weir, Sheila M. E. West, A. J. White, V. T. White, D. J. Wilson, M. E. York-Moore, Bozena K. B. Ziolkowska.

The Leverhulme Foundation have given the college a further grant of £3000 for research in obstetrics and gynæcology.

Royal Institute of Public Health

The Harben medal has been awarded to Prof. E. C. Dodds, F.R.S., and the Smith award to Dr. Andrew Shinnie, medical officer of health for Westminster.

Hospital for Sick Children, Great Ormond Street

The centenary celebrations of this hospital are being held in London at the end of May. On May 27 the Princess Royal will lay a commemoration stone at the hospital, and there will also be a thanksgiving service at St. Martin-in-the-Fields. On May 26 there will be a programme of clinical demonstrations, and on May 29 the hospital will be open to past members of the medical, nursing, and lay staffs.

Ion Exchange Resins

The Physical Methods Group of the Society of Public Analysts and Other Analytical Chemists will discuss this subject at their meeting in Swansea on Friday, May 16. The speakers will include Prof. C. W. Davies, D.SC., Mr. G. H. Osborn, F.R.I.C., and Dr. F. W. Cornish, A.R.I.C. Further particulars may be had from the secretary, Mr. R. A. C. Isbell, A.INST.P., Hilger & Watts, Ltd., Hilger Division, 98, St. Pancras Way, London, N.W.1.

New M.R.C. Unit

The Medical Research Council has established a Unit for Research on the Experimental Pathology of the Skin, under the direction of Prof. J. R. Squire at the department of experimental pathology, Birmingham University. The Council's unit at the Birmingham Accident Hospital will now be known as the Industrial Injuries and Burns Research Unit and will be directed by Dr. J. P. Bull, who was formerly the assistant director.

Council for the Coördination of International Congresses of Medical Sciences

At the second general assembly, held in Geneva, under the chairmanship of Prof. Maurice Visscher (Minnesota University), it was decided to modify the title of the council, which will in future be known as the Council for International Organizations of Medical Sciences (CIOMS). The statutes of the council were also amended to increase the scope of its work. The executive committee was asked to explore methods for the integration on an international level of the indexing and abstracting of medical and biological literature "to render them more complete, more prompt and less expensive to the subscriber."

Royal Appointments

Surgeon Rear-Admiral R. W. Mussen, C.B.E., F.R.C.P., has been appointed honorary physician to the Queen, and Surgeon Rear-Admiral James Hamilton, C.B.E., honorary surgeon to the Queen.

Gresham College, London

On April 28, 29, 30, and May 1, Prof. H. Hartridge, F.R.S., will deliver four lectures at the college. His subject will be the Physiology of the Blood. Further particulars will be found in our advertisement columns.

Welsh Board of Health

The Minister of Health has appointed Mr. H. H. Davies, M.C., to be chairman of the board in succession to Captain Geoffrey Crawshay. Mr. Davies, who is an assistant secretary at the Ministry of Housing and Local Government, was on the staff of the Ministry of Health from 1921 to 1951.

International Congress in Italy

An international medical congress is to be held from Oct. 16 to 18 at Montecatini, an Italian spa, to discuss contemporary medical problems. Further particulars may be had from the secretariat of the Congrès Mondial des Médecins pour l'Étude des Conditions Actuelles de Vie, Corso Trieste, 65, Rome.

EMERGENCY BED SERVICE.—In the week ended last Monday applications for general acute cases numbered 970. The proportion admitted was 91·6%.

CORRIGENDA: *Peripheral Neuritis.*—In this annotation last week (p. 806) the reference to the work of C. D. Aring should have appeared as *Brain*, 1942, **65**, 34.

Medical Register.—The price of the Medical Register for 1952 is 42*s.* (43*s.* post free) and not as stated in our note of April 12. It is obtainable from Constable & Co. Ltd., 10, Orange Street, W.C.1.

Dr. E. R. Boland is visiting Yugoslavia to lecture for the British Council on the organisation of medical training in Great Britain.

Births, Marriages, and Deaths

BIRTHS

BARRINGTON.—On April 13, the wife of Dr. Rupert Barrington, of Haverhill, Suffolk—a son.
BUCKLEY.—On April 9, at Nottingham, the wife of Dr. John Buckley—a son.
CHASE.—On April 10, at West Kirby, the wife of Dr. W. H. Chase—a daughter.
COX.—On April 12, the wife of Dr. Patrick Cox—a son.
ELLIOT-SMITH.—On April 9, at Oxford, the wife of Mr. A. Elliot-Smith, F.R.C.S.—a son.
NAUGHTON.—On April 8, in Edinburgh, the wife of Dr. J. A. L. Naughton—a daughter.
RIDDELL.—On April 9, in Edinburgh, the wife of Dr. Michael Riddell—a son.
SCOTT WARREN.—On April 15, the wife of Dr. David Scott Warren, of Martley, near Worcester—a son.
WILLIAMS.—On April 12, at Ipswich, the wife of Dr. J. R. D. Williams—a son.

MARRIAGES

DAVIDSON—DUNN.—On April 19, at Arbroath, Samuel Lovell Davidson, F.R.C.S.E., to Harriet Elizabeth Marjory Dunn.
GUYMER—BIDSTRUP.—On April 18, in London, Ronald Frank (John) Guymer, M.D., to Patricia Lesley Bidstrup, M.R.C.P.
JOHNSTONE—WHITCOMBE.—On April 19, at Corstorphine, Edinburgh, Robert Douglas Johnstone, M.B., to Barbara Ann Whitcombe.
LAIDLAW—MAIR.—On April 2, at Port Glasgow, Allan James Laidlaw, L.R.C.P.E., of Worcester, to Greta MacAskill Mair, S.R.N.
PRESTON—TIBBS.—On April 19, at Lynchmere, Peter John Preston, M.R.C.S., surgeon lieutenant, R.N., to Margaret Ann Tibbs.

DEATHS

CHENNELL.—On April 16, Eileen Annie Chennell, M.B. Lond., D.P.M.
DEAS.—On April 17, at Bournemouth, Leonard Joseph Montagu Deas, F.R.C.S.E., colonel, I.M.S. retd, aged 78.
FLEMING.—On April 16, in Glasgow, Geoffrey Balmanno Fleming, M.B.E., M.D. Camb., LL.D. Glasg., F.R.C.P., F.R.F.P.S.
GOWANS.—On April 16, Francis Jollie Gowans, C.B., M.B. Durh., surgeon rear-admiral, aged 71.
HARE.—On April 16, John Hare, O.B.E., M.D. Durh., colonel, R.A.M.C. retd, of Chelsea.
JOHNSON.—On April 12, at Westcliff-on-Sea, Henry Johnson, L.M.S.S.A., F.F.A. R.C.S.
LEDGARD.—On April 11, at Windsor, Herbert Arthur (George) Ledgard, M.B. Leeds, surgeon lieut.-colonel, Royal Horse Guards.

Diary of the Week

APRIL 27 TO MAY 3

Sunday, 27th

LONDON JEWISH HOSPITAL MEDICAL SOCIETY
3 P.M. (Woburn House, Upper Woburn Place, W.C.1.) Prof. Arnold Sorsby: Genetics in Medicine.

Monday, 28th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5.15 P.M. Prof. A. M. Boyd: Lymphœdema of the Lower Extremeties.
6.30 P.M. Prof. V. W. Dix: Ureteric Obstruction.
INSTITUTE OF DENTAL SURGERY, Gray's Inn Road, W.C.1
5 P.M. Dr. Frode Hilming (Copenhagen): Periodontitis and Gingivitis as Sources of Headache and Other Head Pain.
ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5.30 P.M. *Section of Odontology.* Dr. G. Neil Jenkins: Laboratory Investigation on the Relation of Fluorine to Dental Caries on Tyneside and District.
ROYAL EYE HOSPITAL, St. George's Circus, S.E.1
5 P.M. Dr. T. H. Whittington: Clinical Aspects of Accommodation. Treatment of the Hypermetrope.
INSTITUTE OF PSYCHIATRY, Maudsley Hospital, Denmark Hill, S.E.5
5.30 P.M. Dr. E. Stengel: Lecture-demonstration.
MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1
8.30 P.M. Mr. W. W. Galbraith and Mr. J. G. Yates Bell: Tuberculosis of Urinary Tract.
MANCHESTER MEDICAL SOCIETY
9 P.M. (University of Manchester.) *Section of General Practice.* Dr. A. Morgan Jones: Treatment of Heart-failure.

Tuesday, 29th

ROYAL COLLEGE OF SURGEONS
5.15 P.M. Prof. Ian Aird: Peripheral Vascular Disease.
6.30 P.M. Prof. T. Pomfret Kilner: Cleft Lip and Palate
UNIVERSITY OF LONDON
5.30 P.M. (University College, Gower Street, W.C.1.) Prof. D. O. Hebb (McGill): Development of Perception and Thought. (First of three lectures.)
ROYAL EYE HOSPITAL
5 P.M. Professor Sorsby: Genetics in Ophthalmology.

Wednesday, 30th

ROYAL COLLEGE OF SURGEONS
5.45 P.M. Mr. Harold Edwards: Abdominal Emergencies in Childhood.
ROYAL EYE HOSPITAL
5.30 P.M. Mr. L. H. Savin: Proptosis.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, W.1
3.30 P.M. Dr. S. Cochrane Shanks: Radiology and its Contribution in the Diagnosis of Abdominal Disease.
MIDDLESEX COUNTY MEDICAL SOCIETY
3 P.M. (Shenley Hospital, near St. Albans, Hertfordshire.) Dr. S. T. Hayward: Psycho-analysis.

Thursday, 1st

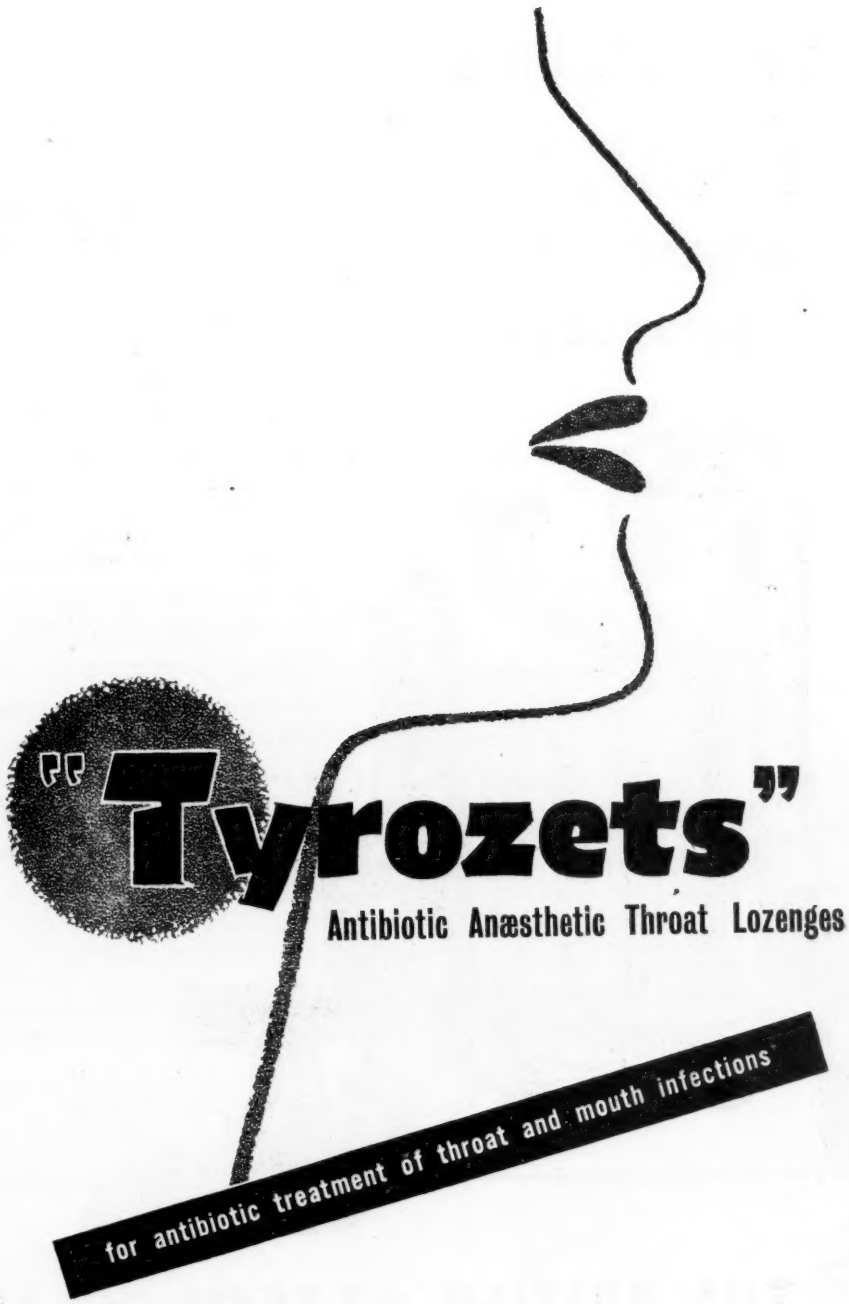
ROYAL COLLEGE OF SURGEONS
5.30 P.M. Dr. H. A. Lucas: Histopathology of Sinusitis.
ROYAL SOCIETY, Burlington House, W.1
10.30 A.M. Prof. W. T. Astbury, F.R.S.: Structure of Proteins.
ROYAL EYE HOSPITAL
5.30 P.M. Miss J. M. Dollar: Surgery of Squint.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, Hyde Park Corner, S.W.1
5 P.M. Dr. Denis Williams: Neurology lecture-demonstration.
WEST END HOSPITAL FOR NERVOUS DISEASES
5.30 P.M. (Department of Psychiatry, 48, Cosway Street, N.W.1.) Dr. E. H. Larkin: Physical Methods of Treatment.
INSTITUTE OF DERMATOLOGY, St. John's Hospital, Lisle Street, W.C.2
5.30 P.M. Dr. J. O. Oliver: Disinfection and Sterilisation.
UNIVERSITY OF DURHAM
5.15 P.M. (Royal Victoria Infirmary, Newcastle upon Tyne.) Dr. E. N. Cook: Hæmaturia. (Rutherford Morison lecture.)
HONYMAN GILLESPIE LECTURE
5 P.M. (University New Buildings, Edinburgh.) Mr. I. A. G. Lawson Dick: Treatment of Dorso-lumbar Fractures of the Spine with Paraplegia.
UNIVERSITY OF ST. ANDREWS
5 P.M. (Medical School, Small's Wynd, Dundee.) Prof. D. Whitteridge: Pathological Physiology of Dyspnœa.

Friday, 2nd

ROYAL COLLEGE OF SURGEONS
5.15 P.M. Prof. B. W. Windeyer: Indications for Radiotherapy.
6.30 P.M. Sir Archibald McIndoe: Surgery of Repair.
ROYAL SOCIETY OF MEDICINE
10.30 A.M. *Section of Otology.* Prof. J. M. Robson, Prof. F. C. Ormerod, Miss E. M. Whetnall, Dr. H. A. Lucas, Mr. A. S. Walker, Mr. Terence Cawthorne: Toxic Effects of Streptomycin and Dihydrostreptomycin on the Acoustic and Vestibular Systems.
ROYAL EYE HOSPITAL
5.30 P.M. Dr. C. A. Keele: Physiology of A.C.T.H. and Cortisone with Special Reference to the Eye.
ROYAL INSTITUTION, 21, Albemarle Street, W.1
9 P.M. Prof. W. D. Wright, D.SC.: Defective Colour-vision.
INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. R. M. B. MacKenna: Common Dermatoses.
INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, W.C.1
5 P.M. Dr. R. Ollerenshaw: Technique of Illustrating Medical Papers and Lectures.

Saturday, 3rd

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, W.C.1
11.30 A.M. Prof. S. Podvinec (Zagreb): Physiology and Pathology of the Soft Palate.



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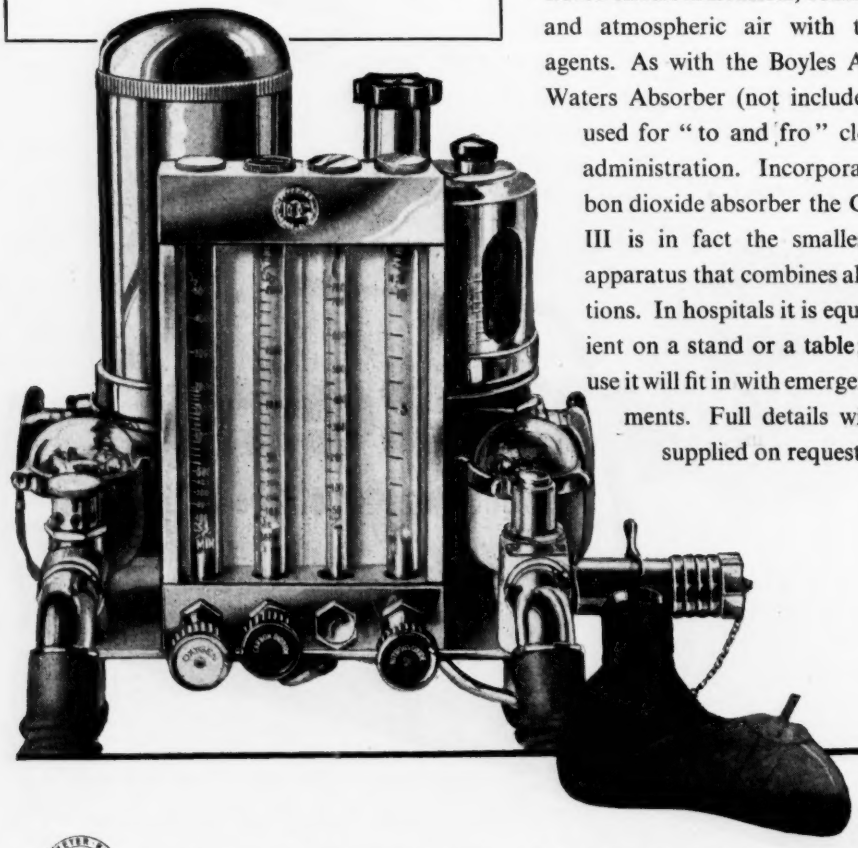

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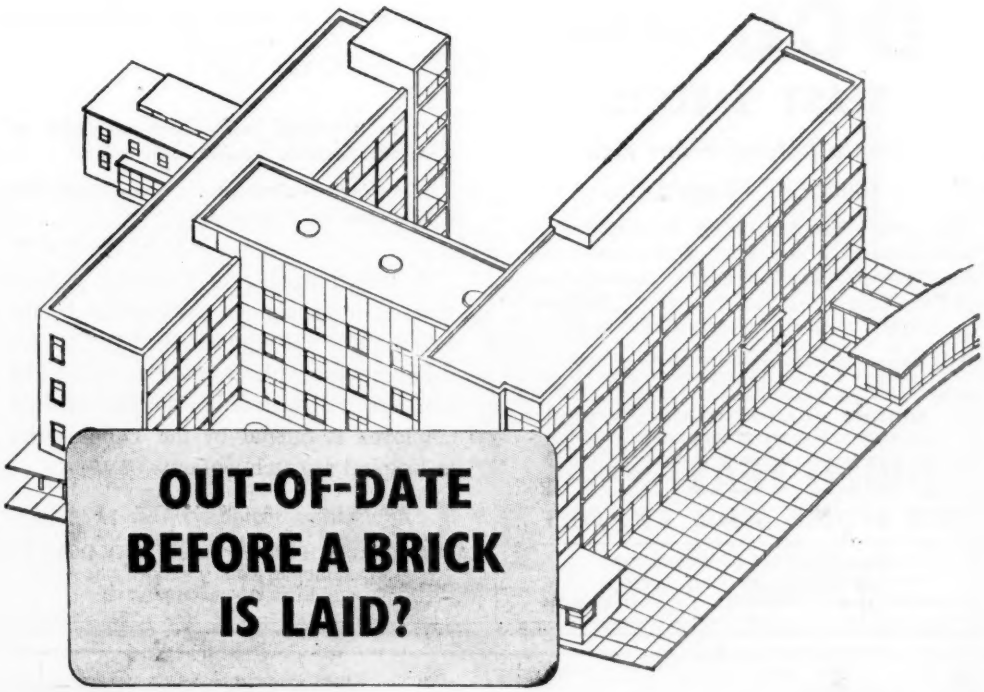

OUT-OF-DATE BEFORE A BRICK IS LAID?

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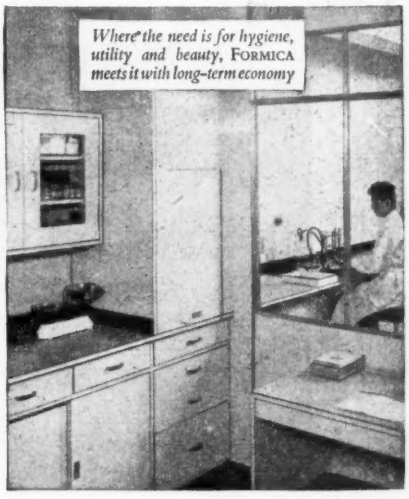

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See LANCET **2**, 1201 (1951)

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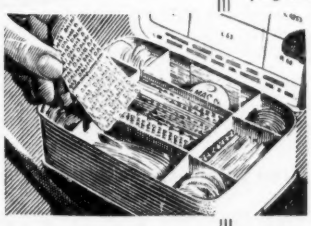

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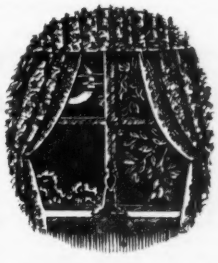

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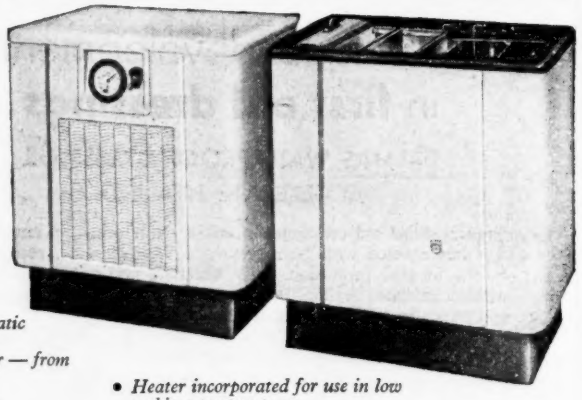

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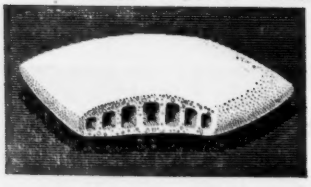

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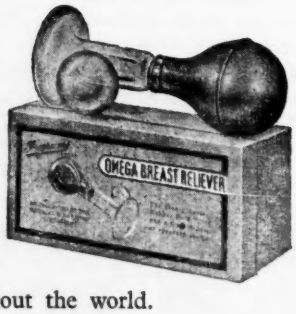

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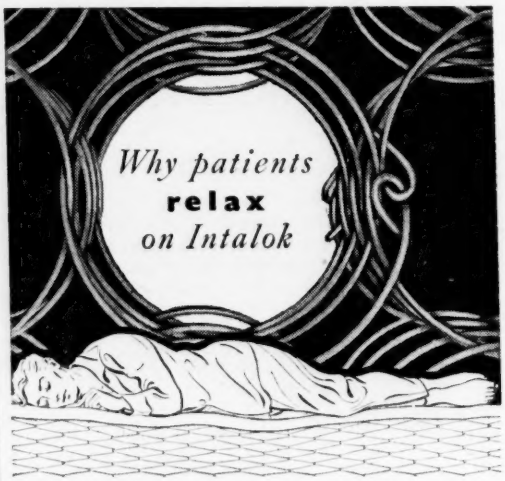

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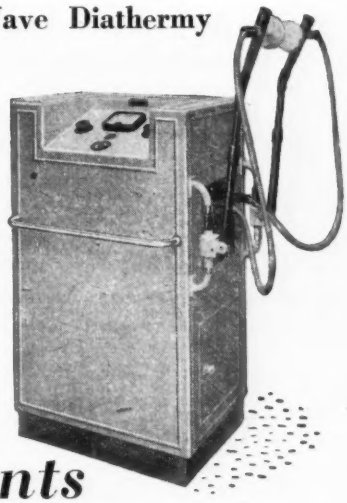

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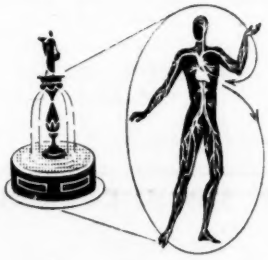

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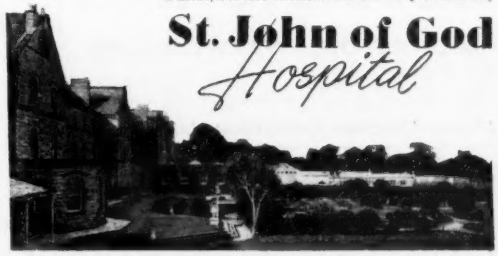

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No student will be eligible to commence the course until 12 months after graduation, and he must hold registrable qualification or be a graduate in medicine and surgery of an approved University. He must also have held suitable posts in general medicine and surgery to fit him to take a higher qualification in anæsthesia.

The fee for the course is £60.

Applications, stating age, qualifications, and experience, together with the names of 3 persons to whom reference may be made, should be lodged with the Dean of the Faculty of Medicine, The University, Liverpool, 3, not later than 17th May, 1952.

UNIVERSITY OF BRISTOL

SESSION 1952–53

COURSES IN MEDICAL RADIOLOGY. The diplomas granted by the University are being discontinued but provided that sufficient applications are received the following courses of instruction suitable for the Diplomas of the Royal Colleges (D.M.R.D. and D.M.R.T.) will begin in OCTOBER, 1952, and will last for 2 academic years (i.e., until June, 1954):—

1. D.M.R.D. Course. The course will be half-time and a limited number of half-time registrarships in diagnostic radiology will be available in the Bristol Clinical Area for which students accepted for the course may apply.

2. D.M.R.T. Course. Training will be given at the Bristol-Bath joint Centre for Radiotherapy, which deals with 1700 new cases of malignant disease every year. D.M.R.T. students are eligible to apply for junior posts in the Department when these become available.

Inquiries about the examinations for both diplomas should be addressed to the Secretary of the Conjoint Board, Examination Hall, Queen-square, London, W.C.1.

The fee for each course is 50 guineas.

Applications for admission to the courses should be sent to the Director of Medical Postgraduate Studies, the University, Bristol, 8, before 16th June, 1952.

UNIVERSITY OF BRISTOL

SESSION 1952–53

Provided that there are sufficient applicants the following postgraduate courses will be arranged, beginning in OCTOBER, 1952.

1. COURSE IN CHILD HEALTH. This will be whole-time and will last for 3 months. The fee for the course will be 20 guineas. The course will be under the direction of the Head of the Department of Child Health in coöperation with the Departments of Preventive Medicine, Medicine, Surgery, Pathology, &c. It will include lectures, demonstrations, ward rounds, and visits to clinics and ancillary institutions.

The University does not itself grant a Diploma in Child Health.

2. DIPLOMA IN PSYCHOLOGICAL MEDICINE (D.P.M. BRISTOL).

(*a*) *Part I.* This will begin in October, 1952, and will cover a period of 2 terms. It will include lectures and demonstrations in special Anatomy and Physiology, Pharmacology, and applied Psychology. The fee for the course will be 20 guineas.

(*b*) *Part II.* This will be designed primarily for Part II of the D.P.M. (Bristol) and will be held in the Autumn and Spring Terms and part of the Summer Term, 1952–53. It will consist of lectures and demonstrations in the clinical aspects of adult and child psychiatry, mental deficiency, and associated subjects. The fee for the course will be 25 guineas.

The course will be open to a limited number of physicians practising in psychiatry, in addition to those preparing for the D.P.M. (Bristol).

3. DIPLOMA IN PUBLIC HEALTH (PART II) (D.P.H. BRISTOL). This part-time course is designed primarily for those who have obtained Part I (C.P.H.) in the University of Bristol, but others who hold the C.P.H. of approved licensing bodies may be considered for admission. The course will last for 1 academic year (October, 1952–June, 1953) and the fee will be £31 10s.

Candidates will be permitted to engage in part-time employment of their own choice for which approval of the University must be sought, or, if they wish, they may be considered for appointment to a few selected vacancies within the City of Bristol which have been made available for suitable applicants.

Further information, copies of regulations for the Bristol Diplomas, and application forms for the courses, may be obtained from the Director of Medical Postgraduate Studies, the University, Bristol, 8. Applications should be made before 16th June, 1952.

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Applications for enrolment should be addressed to Director of Postgraduate Studies, Surgeons' Hall, Edinburgh, 8. Applicants for courses should supply particulars of qualifications and postgraduate experience

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For Regulations apply Registrar, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

GRESHAM COLLEGE, Basinghall-street, London, E.C.2

4 LECTURES will be given by Professor H. HARTRIDGE, M.A., M.D., SC.D., M.R.C.P., F.R.S. (Gresham Professor in Physic), on "The Physiology of the Blood," MONDAY–THURSDAY, 28TH APRIL–1ST MAY.

The lectures are free and begin at 5.30 P.M.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL

The JENNER MEMORIAL LECTURE for 1952 will be given by Brigadier J. S. K. BOYD, F.R.S., in the Board Room of St. George's Hospital, Hyde Park Corner, on TUESDAY, 20TH MAY, at 5.30 P.M. His subject will be :—

"Bacteriophage Typing and Epidemiological Problems."

Admission free without ticket.

THE WRIGHT-FLEMING INSTITUTE OF MICROBIOLOGY

ST. MARY'S HOSPITAL MEDICAL SCHOOL, London, W.2

A Course of 6 ALMROTH WRIGHT LECTURES has been arranged for the SUMMER SESSION, 1952. These Lectures will be given on the following dates in the Lecture Theatre of this Institute at 5 P.M.

Tuesday, 6th May
Prof. G. R. CAMERON, F.R.S. (University College Hospital, London, W.C.1). "Pathology at the Cross-roads."

Tuesday, 13th May
Prof. W. I. B. BEVERIDGE, D.V.SC. (Department of Animal Pathology, Cambridge). "Some Aspects of Immunity to Virus Diseases."

Tuesday, 20th May
Dr. D. W. HENDERSON, D.SC., PH.D. (Microbiological Research Department, Experimental Station, Porton). "The Pathogenesis of Experimental Pulmonary Anthrax."

Tuesday, 27th May
Prof. C. M. MACLEOD, M.D. (New York University College of Medicine). Title to be announced later.

Tuesday, 3rd June
Dr. W. H. BRADLEY, D.M., M.R.C.P. (Ministry of Health, London). "Diphtheria. Beware!"

Tuesday, 10th June
Dr. E. JAWETZ, M.D. (University of California Medical Centre). "Antibiotic Synergism and Antagonism."

These Lectures are open to all members of the Medical Profession and to all Students in Medical Schools without fee.

CHELSEA POLYTECHNIC, S.W.3. The Governing Body invite applications for the post of HEAD OF DEPARTMENT OF PHYSIOLOGY. Candidates should possess suitable qualifications in Physiology and/or Pharmacology and have had experience in both teaching and research. Salary in accordance with Burnham Technical Teachers' Scale for Heads of Departments—Grade II (Men £1000–£25–£1150 ; Women £800–£20–£920), plus London allowance of £36 or £48 according to age.

Form of application and full particulars may be obtained by sending a stamped addressed foolscap envelope to the Clerk to the Governors, to whom applications should be submitted not later than 5th May, 1952.

UNIVERSITY OF LONDON. The Senate invite applications for the READERSHIP IN BIOLOGY tenable at St. Thomas's Hospital Medical School (salary £1050–£1250–£1450 a year).

Applications (10 copies) must be received not later than 20th May, 1952, by the Academic Registrar, University of London, Senate House, W.C.1, from whom further particulars should be obtained.

UNIVERSITY OF LONDON. The Senate invite applications for the READERSHIP IN PHYSICS tenable at St. Thomas's Hospital Medical School (salary £1050–£1250–£1450 a year).

Applications (10 copies) must be received not later than 19th May, 1952, by the Academic Registrar, University of London, Senate House, W.C.1, from whom further particulars should be obtained.

THE UNIVERSITY OF SHEFFIELD. Applications are invited for 2 posts of DEMONSTRATOR IN ANATOMY, to begin duties on 1st October, 1952. Salary scale £600–£25–£650, with superannuation provision under the F.S.S.U., and a family allowance. Commencing salary on the scale will depend on the qualifications and experience of the successful candidate.

Applications (4 copies), together with the names and addresses of referees, and, if desired, copies of testimonials, should reach the undersigned (from whom further particulars may be obtained) not later than 24th May, 1952. A. W. CHAPMAN, Registrar.

THE UNIVERSITY OF LIVERPOOL. Department of OBSTETRICS AND GYNÆCOLOGY. Applications are invited for 2 Whole-time RESIDENT OBSTETRIC TUTORSHIPS for the Liverpool Maternity Hospital and for Mill Road Maternity Hospital. The salary will be fixed according to qualifications and experience, but will be not less than £600 p.a., with board-residence. The appointment will be for 1 year in the first instance, duties to commence on 1st October, 1952. Previous resident experience in obstetrics and gynæcology is essential and higher qualifications in these subjects are desirable.

Applications, stating age, academic qualifications, and experience, together with the names of 3 referees, should be received not later than 24th May, 1952, by the undersigned, from whom further particulars may be obtained.

STANLEY DUMBELL, Registrar.

THE WELSH NATIONAL SCHOOL OF MEDICINE. UNIVERSITY OF WALES. Applications are invited for the full-time post of LECTURER in the Department of Pharmacology. Medical qualification not essential. Salary will be within the range £550–£50–£1100 p.a., the point of entry depending on experience and credentials, with participation in the Family Allowance and Superannuation Schemes.

Further particulars may be obtained from the undersigned, by whom applications should be received not later than 15th May, 1952. F. DODSWORTH, Secretary.

34, Newport-road, Cardiff, 5th April, 1952.

Hospital Services : Senior Appointments

(See Note under Appointments, p. 882 of Text.)

GUY'S HOSPITAL/EVELINA HOSPITAL, S.E.1. The Board of Governors invites applications for the post of VISITING CONSULTANT in the E.N.T. Department for attendance on 4 sessions per week, 2 at Guy's and 2 at the Evelina Hospital. The appointment will commence on 1st October, 1952, and remuneration will be in accordance with the Ministry of Health's rates for Consultants.

Applications (10 copies), together with the names of 3 referees, should be sent to the Superintendent, Guy's Hospital, London Bridge, S.E.1, on or before 31st May, 1952. Canvassing of members of the Board or of the Advisory Appointments Committee will disqualify.

HOSPITALS FOR DISEASES OF THE CHEST. BROMPTON HOSPITAL, S.W.3. The Board of Governors invites applications for the appointment of ASSISTANT PHYSICIAN (Consultant), tenable at Brompton Hospital. The appointment involves attendance on 1 notional half-day each week to conduct an Outpatient clinic and with charge of a limited number of beds in the first instance. Further information may be obtained on request. Candidates are required to be Fellows or Members of the Royal College of Physicians of London.

Applications (12 copies), stating date of birth, qualifications, and experience, with the names of 3 referees, should reach the undersigned not later than 31st May, 1952.

KENNETH A. F. MILES, Secretary to the Board.

Brompton Hospital, S.W.3.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, N.W.8. Applications are invited for the post of HONORARY ASSISTANT PHYSICIAN. Candidates must be a Member or Fellow of one of the Royal Colleges of Physicians.

Applications (25 copies), should be sent to the undersigned on or before 31st May, 1952. Testimonials are not required but the names of 3 persons willing to act as referees should be furnished. Sister MARY CLARE, Secretary.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the following Consultant positions :—

(1) Full-time or maximum Part-time CONSULTANT OBSTETRICIAN AND GYNÆCOLOGIST, Oldchurch Hospital, Romford, Essex.

(2) Part-time CONSULTANT E.N.T. SURGEON, Rush Green Hospital, Romford, Essex (2 sessions a week).

(3) Part-time CONSULTANT SURGEON, Metropolitan Hospital, Kingsland-road, E.8 (3 sessions a week).

(4) Full-time or maximum Part-time CONSULTANT THORACIC SURGEON, North East Metropolitan Hospital Region (primary duties in the first instance to be at North Middlesex Hospital and Annexes, Silver-street, N.18, Broomfield Hospital, near Chelmsford, Essex, and Black Notley Hospital, near Braintree, Essex).

Applications (6 copies), indicating post concerned, and stating private address, date of birth, full details of qualifications, and experience, present appointment(s) (including number of sessions), grade and salary, together with names and addresses of 3 referees, should reach C. E. NICOL, Secretary, 11A, Portland-place, London, W.1, by Saturday, 10th May, 1952.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a Whole-time ASSISTANT PATHOLOGIST (Senior Hospital Medical Officer grade) to work under the Group Pathologist in the Wandsworth Hospital Group Laboratory at St. James' Hospital, Balham, London, S.W.12. Candidates should have a wide general experience in pathology and the possession of a higher degree would be an advantage.

Applications (5 copies), stating date of birth, qualifications, experience, and present appointment(s), and giving the names and addresses of 3 referees, should be made by letter and sent to the Secretary (S.D.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, London, W.1, to arrive not later than 10th May, 1952. Applicants may visit the laboratory and hospitals by local arrangement.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a Part-time ASSISTANT OPHTHALMOLOGIST (Female), 1 half-day per week, at the South London Hospital for Women, S.W.4. Salary scale £1300–£50–£1750 p.a.

Applications (5 copies), stating date of birth, qualifications, experience, and present appointment, and giving the names and addresses of 3 referees, should be made by letter and sent to the Secretary (S.D.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, London, W.1, to arrive not later than 10th May, 1952. Applicants may visit the Hospital by local arrangement.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of Part-time CHILD PSYCHIATRIST (4 half-days per week) to the L.C.C. Child Guidance Unit at 6, Cambridge-road, S.W.11. Salary scale £1300–£50–£1750 p.a. The successful candidate will be required to undertake psychotherapy.

Applications (5 copies), stating date of birth, qualifications, experience, and present appointment(s), and giving the names and addresses of 3 referees, should be made by letter and sent to the Secretary (S.D.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, London, W.1, to arrive not later than 10th May, 1952. Applicants may visit the Unit by local arrangement.

Provincial

For Consultant appointments at Romford, Essex, please see North East Metropolitan Regional Hospital Board advertisement in London Section.

ISLE OF MAN HEALTH SERVICES BOARD. Applications are invited from registered medical practitioners with higher qualifications in psychiatry for the post of CONSULTANT PSYCHIATRIST to act as Medical Superintendent of Ballamona Hospital, Braddan, Isle of Man, a hospital of 345 Beds for mental and nervous disorders, with duties at outpatient psychiatric clinics at hospitals in Douglas and Ramsey. The appointment will be on a whole-time basis, with salary and terms and conditions of service, including superannuation, as negotiated between the Ministry of Health and the medical profession. Separate house at Ballamona Hospital with fuel, light, water, vegetables, and milk on reasonable terms.

Application forms may be obtained from the Secretary, Isle of Man Health Services Board, 32, Circular-road, Douglas, Isle of Man, to whom completed forms should be returned not later than 10th May, 1952. Canvassing will disqualify.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the appointment of Whole-time ASSISTANT ANÆSTHETIST (Senior Hospital Medical Officer scale) for duties at hospitals in the Hull A and East Riding Hospital Management Committee groups. The successful candidate will be required to reside in or near Hull or within such distance of that town as the Board may approve.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Park-parade, Harrogate, not later than 17th May, 1952.

LEEDS REGIONAL HOSPITAL BOARD invites applications from suitably qualified practitioners for the whole-time non-resident post of ASSISTANT PATHOLOGIST (Senior Hospital Medical Officer scale) for duties at hospitals in the Halifax group. The successful candidate will work under the general guidance of the Consultant in charge of the Department, and will be required to reside in Halifax or within such distance of that town as the Board may approve.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Park-parade, Harrogate, not later than 17th May, 1952.

LIVERPOOL REGIONAL HOSPITAL BOARD. Fazakerley GROUP OF HOSPITALS. Applications are invited for the post of Whole-time ASSISTANT PATHOLOGIST with duties at Aintree Hospital (Sanatorium of 505 Beds) and Fazakerley Hospital (352 Beds for Infectious Diseases). Applicants should have special experience in bacteriology. The appointment is vacant from 1st October, 1952. The salary is within the scale £1300, at age 32, by £50 to £1750.

Forms of application from, and to be returned to, Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 17th May, 1952.

VINCENT COLLINGE, Secretary to the Board.

LIVERPOOL REGIONAL HOSPITAL BOARD. Chester AREA. Applications are invited for the post of Whole-time TUBERCULOSIS MEDICAL OFFICER, with duties in the Chester Area. The person appointed will work under the direction of the Consultant Chest Physician and will undertake preventive and aftercare duties with the local health authorities concerned. Candidates should have good general medical experience and special experience in tuberculosis. The salary will be within the scale £1300, at age 32, by £50–£1750.

Forms of application from, and to be returned to, Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 10th May, 1952.

VINCENT COLLINGE, Secretary to the Board.

NEWCASTLE REGIONAL HOSPITAL BOARD. TeesSIDE HOSPITAL MANAGEMENT COMMITTEE GROUP. 3 ANÆSTHETISTS required for part-time duties each up to 5 notional half-days per week in hospitals in the above Group. 1 Consultant (assistant) status, and 2 Senior Hospital Medical Officers.

Applications, together with names and addresses of 1–3 referees and/or 1–3 testimonials, should be addressed to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 28 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Regional THORACIC CENTRE, SHOTLEY BRIDGE HOSPITAL. (Thoracic beds at Shotley Bridge Hospital 160; other beds in sanatoria throughout the Region.) CONSULTANT ANÆSTHETIST (assistant), whole-time or part-time for a minimum of 9 notional half-days per week. Salary scale £1700–£2750 whole-time, pro rata part-time. The work at Shotley Bridge Hospital is almost entirely non-tuberculous (cardiovascular, œsophageal, and pulmonary). Further particulars may be obtained from the Senior Consultant Anæsthetist, Regional Thoracic Unit, Shotley Bridge Hospital.

Applications, together with names and addresses of 1–3 referees and/or 1–3 testimonials, should be addressed to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 28 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Regional THORACIC SERVICE. CONSULTANT THORACIC SURGEON (assistant) required whole-time or part-time for a minimum of 9 notional half-days per week. Salary scale £1700–£2750 whole-time, pro rata part-time. The surgeon appointed will be a member of the Regional Thoracic Surgery team, and will be obliged to reside near Seaham Hall Sanatorium. He will be required to take main charge of the Pulmonary Tuberculosis Thoracic Surgical Unit at Seaham Hall in addition to taking part in the Regional Thoracic Service as may be required from time to time. Additional information may be obtained from the Senior Surgeon, Regional Thoracic Service, Shotley Bridge Hospital, co. Durham.

Applications, together with names and addresses of 1–3 referees and/or 1–3 testimonials, should be addressed to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 28 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Regional THORACIC SERVICE. CONSULTANT ANÆSTHETIST (assistant), whole-time or part-time for a minimum of 9 notional half-days per week. Salary scale £1700–£2750 whole-time, pro rata part-time. This appointment, though primarily connected with the pulmonary tuberculosis thoracic surgical department at Seaham Hall Sanatorium in the Sunderland Hospital Management Committee Group, also carries duties as required in the regional thoracic surgical service—e.g., at Shotley Bridge Hospital and Poole Sanatorium.

Applications, together with names and addresses of 1–3 referees and/or 1–3 testimonials, should be addressed to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 28 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. GatesHEAD HOSPITAL MANAGEMENT COMMITTEE. Main Hospitals: Queen Elizabeth (300 Beds); Bensham (240 Beds); &c. CONSULTANT ANÆSTHETIST (assistant) required for 3 notional half-days per week. Salary in accordance with the national terms and conditions. The present part-time Senior Registrar is likely to be an applicant.

Applications, together with names and addresses of 1–3 referees and/or 1–3 testimonials, should be addressed to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. SunderLAND HOSPITAL MANAGEMENT COMMITTEE GROUP. CONSULTANT PATHOLOGIST (assistant) whole-time for laboratories in the above Group. Salary scale £1700–£2750. The appointee will be required to reside in Sunderland. Candidates may arrange to see the Sunderland Laboratory Service and to obtain further particulars by application to the Senior Pathologist, Sunderland Royal Infirmary.

Applications, together with names and addresses of 1–3 referees and/or 1–3 testimonials, should be addressed to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 28 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. NewCASTLE HOSPITAL MANAGEMENT COMMITTEE GROUP. Main hospitals: Newcastle General (950 Beds); St. Mary Magdalene Home (100 Beds); Ponteland (80 Beds), &c. Total geriatric beds approximately 300. ASSISTANT PHYSICIAN (geriatrics) Senior Hospital Medical Officer status, whole-time or part-time for a minimum of 9 notional half-days per week. Whole-time salary scale £1300–£1750, pro rata part-time. The physician appointed will be responsible for the care of the health of the nursing staff at Newcastle General Hospital and for the medical examination of candidates for appointment, &c., as required. Applicants may visit the hospitals by arrangement with the Physician in charge of the Geriatric Unit, Newcastle General Hospital, Newcastle, 4.

Applications, together with the names and addresses of 1–3 referees and/or 1–3 testimonials, should be sent to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 28 days.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT PSYCHIATRIST required at Leavesden Hospital, Abbots Langley, Watford (2176 Beds for Mental Defectives). Salary £1300–£1750. Hospital may be visited by direct appointment.

Applications, giving date of birth, and names of 3 referees, to Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 31st May, 1952.

SHEFFIELD REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners who are in possession of the D.A. for the whole-time post of ASSISTANT ANÆSTHETIST for hospitals in the Mansfield area. The hospitals concerned would be Mansfield and District General Hospital; the Victoria Hospital, Mansfield; Kings Mill Hospital, Mansfield; Harlow Wood Orthopædic Hospital, near Mansfield; and the Royal Hospital, Chesterfield. The person appointed will be required to reside within 10 miles of Mansfield. Salary scale £1300–£50–£1750 p.a.

Application forms and further details may be obtained from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10. Completed forms must be returned to the Secretary not later than 17th May, 1952.

SHEFFIELD REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the post of Whole-time SENIOR ASSISTANT RADIOTHERAPIST to the Radiotherapy Centre at Leicester Royal Infirmary where the successful candidate will work under the direction of the Consultant Radiotherapist in charge. Candidates should have a good clinical background and be in possession of the D.M.R. (T.). Salary scale £1300–£50–£1750 p.a. The appointee will be required to reside within 10 miles of the Centre.

Application forms and further details may be obtained from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10. Completed forms must be returned to the Secretary not later than 17th May 1952.

SHEFFIELD REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners with a higher qualification in surgery for the whole-time post of CONSULTANT THORACIC SURGEON who would be required to carry out duties at the Nottingham City Hospital and associated sanatoria. Sessions will also be undertaken at the Springfield Hospital (Tuberculosis), Grimsby. The successful candidate will be required to reside within 10 miles of the Nottingham City Hospital.

Application forms and further details may be obtained from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10. Completed forms must be returned to the Secretary not later than 17th May, 1952.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for 3 whole-time non-resident posts of ASSISTANT ANÆSTHETIST to work under the general guidance of the Group Consultants at the following centres :—

(*a*) West Manchester Hospitals : Park Hospital, Davyhulme ; Eccles and Patricroft Hospital and Stretford Memorial Hospital.

(*b*) Wigan and Leigh Hospitals : Royal Albert Edward Infirmary, Wigan ; Leigh Infirmary, &c., and also Wrightington Hospital.

(*c*) Oldham and District Hospitals : Oldham Royal Infirmary ; Oldham District General Hospital, &c.

In posts (*a*) and (*b*) facilities available for gaining experience in anæsthesia for thoracic surgery. Salary £1300–£50–£1750. The successful candidates would be required to live near their main hospitals.

Forms of application may be obtained from the Senior Administrative Medical Officer to the Board at Cheetwood-road, Manchester, 8, and should be returned, together with the names and addresses of 3 referees, to be received not later than 19th May, 1952.

MANCHESTER. UNITED MANCHESTER HOSPITALS, DEPARTMENT OF CLINICAL PATHOLOGY. The Board of Governors invite applications for the appointment of a Whole-time CONSULTANT PATHOLOGIST. The selected candidate will be the Deputy Director of the Group Department of Clinical Pathology, responsible mainly for the Laboratories of St. Mary's Hospital, and will be expected to assist in the teaching of students. Candidates must have had a wide experience of clinical pathology, in particular bacteriology and hæmatology, and possess higher qualifications in medicine or pathology. Salary will be at the scale for Consultants according to qualifications and age.

Applications, together with the names of 3 referees, should be addressed to the Secretary, United Manchester Hospitals, Manchester Royal Infirmary, Manchester, 13, not later than 1st June, 1952.

SHEFFIELD REGIONAL HOSPITAL BOARD. Applications are invited from suitably qualified registered medical practitioners for the whole-time post of CONSULTANT PATHOLOGIST in charge of the City General Hospital Laboratory, Sheffield. The laboratory is a modern one, with facilities for all types of pathological work. A Pregnancy Diagnosis Centre for the North of England is now in operation. The Hospital has a Thoracic Surgical Unit, a Regional Cardiological Centre and Professorial Medical and Gynæcological Units. There are 3 subsidiary laboratories at other hospitals. Candidates must have had experience in all branches of pathology, and should have a special interest in morbid anatomy and histology. The successful candidate will be required to reside within 10 miles of the City General Hospital.

Application forms and further details may be obtained from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10. Completed forms should be returned to the Secretary not later than 17th May, 1952.

SHEFFIELD REGIONAL HOSPITAL BOARD. Applications are invited from suitably qualified registered medical practitioners for the whole-time Consultant post of SENIOR RADIOTHERAPIST at the Hogarth Radiotherapeutic Centre (Nottingham General Hospital), and associated clinics in the area. The appointee will be required to reside within 10 miles of the Centre.

Application forms and further details may be obtained from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10. Completed forms must be returned to the Secretary not later than 17th May, 1952.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. The Northern Regional Hospital Board (Scotland) invite applications for the following appointments at Craig Dunain Hospital, Inverness (930 Beds) :—

(1) CONSULTANT PSYCHIATRIST AND DEPUTY MEDICAL SUPERINTENDENT.

(2) ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer grade).

Candidates should have a specialist qualification in psychiatry and suitable experience in its various branches. A higher qualification in medicine would be an advantage for the Consultant post. In addition to the duties at Craig Dunain Hospital, the successful candidates will take part in maintaining a Consulting Service and Outpatient Clinics throughout the region. The posts are whole-time and the salaries are in accordance with the terms and conditions of service for hospital medical staff under the National Health Service.

Schedules of application and further particulars of the appointments may be obtained from the undersigned, with whom applications, including the names of 3 referees, should be lodged by Monday, 12th May, 1952.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a Whole-time ASSISTANT PSYCHIATRIST, to work under Consultant Psychiatrists at Belmont Hospital, Sutton, Surrey. Salary scale £1300–£50–£1750 p.a. The successful candidate will be required primarily to take charge of the E.E.G. Department, but facilities will be provided for taking part in clinical psychiatry. Facilities exist also for research and the department is well staffed with technicians.

Applications (5 copies), stating date of birth, qualifications, experience, and present appointment(s), and giving the names and addresses of 3 referees, should be made by letter and sent to the Secretary (S.D.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, London, W.1, to arrive not later than 10th May, 1952. Applicants may visit the Hospital by local arrangement.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a Whole-time ASSISTANT CHEST PHYSICIAN for the Chichester Area, to be resident at Aldingbourne House Sanatorium, Chichester. Salary scale £1300–£50–£1750 p.a. Candidates should have wide experience in the treatment of tuberculosis and chest diseases and possession of a higher medical qualification will be an advantage. The successful candidate will be required to work under the supervision of the Consultant Chest Physician for the Chichester Area, who is also Physician-Superintendent of Aldingbourne House. In addition to supervision of tuberculosis cases at the Sanatorium (100 Beds, with Bognor Regis annexe), outpatient clinic sessions are held both at Aldingbourne and Bognor.

Applications (5 copies), stating date of birth, qualifications, experience, and present appointment(s), and giving the names and addresses of 3 referees, should be made by letter and sent to the Secretary (S.D.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, London, W.1, to arrive not later than 10th May, 1952. Applicants may visit the Area by local arrangement.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a CONSULTANT SURGEON, whole-time or part-time 9 half-days per week, to the Portsmouth Group of Hospitals. Applicants must possess higher qualifications and have wide experience in general surgery. Residence in the Portsmouth Area will be a condition of the appointment.

Applications (5 copies), stating date of birth, qualifications, experience, and present appointment, and giving the names and addresses of 3 referees, should be made by letter and sent to the Secretary (S.D.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, London, W.1, to arrive not later than 24th May, 1952. Applicants may visit the hospitals by local arrangement.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a Part-time CONSULTANT E.N.T. SURGEON (5 half-days per week) to the Kingston (Surrey) Group of Hospitals. Duties mainly at Kingston Hospital, Wolverton-avenue, Kingston upon Thames.

Applications (5 copies), stating date of birth, qualifications experience, and present appointment, and giving the names and addresses of 3 referees, should be made by letter and sent to the Secretary (S.D.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, London, W.1, to arrive not later than 24th May, 1952. Applicants may visit the hospitals by local arrangement.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as CONSULTANT RADIOLOGIST to the Hastings Group of Hospitals. Candidates must have had a wide experience in diagnostic radiology and hold an appropriate Diploma. Choice of whole-time service or the maximum number of part-time sessions will be offered. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales). Candidates may visit the hospitals concerned.

Apply, stating nationality, age, sex, qualifications, and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1. The last day for acceptance of applications will be 10th May, 1952, and selected candidates will be interviewed in London on 12th June, 1952.

WELSH REGIONAL HOSPITAL BOARD. Wanted, for holiday relief, a whole-time Locum Tenens ORTHOPÆDIC SURGEON for the Caernarvon and Anglesey area, based at the Caernarvon and Anglesey General Hospital, Bangor, from 28th June to 19th July, 1952. The remuneration will be in accordance with the terms and conditions of service for hospital medical and dental staffs.

Applications should be addressed to the Senior Administrative Medical Officer, Welsh Regional Hospital Board, The Temple of Peace and Health, Cathays Park, Cardiff.

WELSH REGIONAL HOSPITAL BOARD. Wanted immediately, a whole-time Locum Tenens ASSISTANT PSYCHIATRIST for a period of 3 months at Cefn Coed Hospital, Swansea. Accommodation is available at the Hospital for which an appropriate charge will be made. Remuneration will be at 31½ guineas per week in accordance with the terms and conditions of service.

Applications should be addressed to the Senior Administrative Medical Officer, Temple of Peace and Health, Cathays Park, Cardiff.

CANADA. WINNIPEG MUNICIPAL HOSPITALS, Morley-avenue, WINNIPEG, CANADA. Applications are invited for the position of DIRECTOR of Physical Medicine at the above Hospitals. Applicants should hold a diploma in Physical Medicine and have some experience in the treatment of chronic diseases.

Further information regarding terms of employment, possibility of other part-time appointments or of private practice may be obtained from the Medical Director, Winnipeg, Municipal Hospitals. Applicants should state age, qualifications, experience, and enclose 2 references.

Hospital Services : Junior Appointments

(See Note under Appointments, p. 882 of Text.)

BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.11. BATTERSEA AND PUTNEY GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON (resident) from 18th May.

Apply, enclosing copies of 3 recent testimonials, to Administrative Officer, by 10th May.

ALBERT DOCK FRACTURE AND ORTHOPÆDIC HOSPITAL, Alnwick-road, E.16. Applications are invited for the appointment of SENIOR HOUSE SURGEON (resident) at £670 p.a. with authorised deductions.

Applications, stating age, qualifications, and experience, together with the names of 3 referees, should reach the undersigned on or before 12th May. F. A. LYON, Secretary.

Dreadnought Seamen's Hospital, S.E.10.

BETHLEM ROYAL HOSPITAL AND THE MAUDSLEY HOSPITAL. Applications are invited from registered medical practitioners for the appointment of SENIOR REGISTRAR, commencing on 1st July, 1952, at the above Postgraduate Teaching Hospital with which is associated the Institute of Psychiatry (University of London). Candidates should have a higher medical qualification, and experience in psychiatry is essential. The commencing salary is £1000 a year. Deductions will be made for meals supplied and for residential amenities if provided. Opportunities for research are available.

Applications, giving details of experience, and the names of 2 referees, should be made within 1 week of the appearance of this advertisement. Application forms obtainable from K. J. JOHNSON, House Governor, Maudsley Hospital, Denmark-hill, S.E.5.

BETHLEM ROYAL HOSPITAL AND THE MAUDSLEY HOSPITAL. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER, commencing on 1st July, 1952, at the above Postgraduate Teaching Hospital, with which is associated the Institute of Psychiatry (University of London). Applicants should intend to take a full training in psychiatry and should have held a resident appointment in a general hospital. Experience in general medicine and neurology, or in the basic sciences, is an advantage. The salary will be £670 a year. Deductions will be made for meals supplied and for residential amenities if provided.

Applications, giving details of experience, and the names of 2 referees, should be made within 1 week of the appearance of this advertisement. Application forms obtainable from K. J. JOHNSON, House Governor, Maudsley Hospital, Denmark-hill, S.E.5.

BETHLEM ROYAL HOSPITAL AND THE MAUDSLEY HOSPITAL. Applications are invited from registered medical practitioners for the appointment of REGISTRAR commencing on 1st July, 1952, at the above Postgraduate Teaching Hospital, with which is associated the Institute of Psychiatry (University of London). Candidates with postgraduate experience in general medicine and neurology, or in psychology, will receive special consideration. The salary will be £775 a year, less a deduction of £120 a year for residential amenities if provided.

Applications, giving details of experience, and the names of 2 referees, should be made within 1 week of the appearance of this advertisement. Application forms obtainable from K. J. JOHNSON, House Governor, Maudsley Hospital, Denmark-hill, S.E.5.

BROOK GENERAL HOSPITAL, Shooters Hill-road, S.E.18. HOUSE PHYSICIAN (infectious diseases), vacant 1st June. 6 months appointment. Salary £350–£450 p.a., less £100 for residence.

Apply to Secretary, Memorial Hospital, Woolwich, S.E.18.

CONNAUGHT HOSPITAL, Walthamstow, E.17. Applications are invited for the post of HOUSE PHYSICIAN for a period of 6 months, vacant 7th June, 1952.

Applications, stating age, qualifications, and experience, together with copies of 2 recent testimonials, should be sent immediately to the Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

GERMAN HOSPITAL, Dalston, E.8. (218 Beds.) Applications are invited for appointments as HOUSE SURGEONS (first, second, or third posts), now vacant, at the above Hospital, and should be sent, with copies of recent testimonials, to the Group Secretary, Hospital Management Committee, Hackney Hospital, London, E.9, as soon as possible, quoting reference GH/HS.

HACKNEY HOSPITAL, E.9. (805 Beds.) Applications are invited for the post of CASUALTY HOUSE OFFICER, also to act as House Physician to the Skin Department, post vacant 1st May and tenable for 6 months.

Applications, with copies of 3 testimonials, should be sent to the Secretary, Hospital Management Committee, Hackney Hospital, E.9, by not later than 5th May, 1952, quoting reference HH/CHO.

HACKNEY HOSPITAL, E.9. (805 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER for Casualty Officer duties, post now vacant and tenable for 12 months.

Applications, with copies of 3 testimonials, should be sent to the Secretary, Hospital Management Committee, Hackney Hospital, E.9, by not later than 5th May, 1952, quoting reference HH/SHO.

HAMPSTEAD GENERAL HOSPITAL, The Green, N.W.3. (ROYAL FREE GROUP.) Applications are invited from registered medical practitioners (Male or Female), for the posts of RESIDENT CASUALTY OFFICER (graded as Senior House Officer). Salary £670 p.a. 2 vacancies : (*a*) vacant 16th May, 1952 ; (*b*) vacant 16th June, 1952, both tenable for 6 months at the Main Outpatient Department, Camden Town, N.W.1.

Applications to be made on the prescribed form, together with copies of 3 recent testimonials, to the Administrative Officer not later than 30th April, 1952.

HAMPSTEAD GENERAL HOSPITAL, The Green, N.W.3. Applications are invited from registered medical practitioners, Male or Female, for the post of CASUALTY OFFICER (non-resident), vacant 24th May, 1952, tenable for a period of 6 months. Salary in accordance with the national scale.

Applications on the prescribed form, with copies of 3 recent testimonials, to be returned to the Administrative Officer by 30th April, 1952.

FINCHLEY MEMORIAL HOSPITAL, N.12. Resident HOUSE PHYSICIAN (third appointment) required, to commence duty on 8th May.

Applications, stating age, experience, and names of 2 referees, to be sent to the Hospital Secretary.

KING EDWARD MEMORIAL HOSPITAL, Ealing. SOUTH WEST MIDDLESEX HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN, post vacant on 1st June, 1952.

Applications, stating age, nationality, and qualifications with dates, details of experience, together with copies of 2 recent testimonials, to Secretary of Committee, West Middlesex Hospital, Isleworth, by 13th May, 1952.

AMENDED ADVERTISEMENT

LAMBETH HOSPITAL. South West Metropolitan REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR required. D.A. not essential ; facilities given for trainees for the diploma. Canvassing will disqualify, but candidates are not precluded from visiting the Hospital if they so desire.

For forms of application apply (enclosing stamped addressed envelope) to the Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11, to whom completed applications should be returned not later than 10th May, 1952.

LEWISHAM HOSPITAL, London, S.E.13. Applications are invited for one of 2 posts of CASUALTY OFFICER (Senior House Officer grade), resident preferred but not essential. The appointment, which is vacant immediately, is tenable for 1 year and includes Outpatient Clinic duties. Salary £670 p.a., less an appropriate charge for board, lodging, &c., if resident.

Applications, stating age, nationality, qualifications, and experience, with names of 3 referees, should be addressed to the Secretary, Lewisham Group Hospital Management Committee, Lewisham Hospital, London, S.E.13.

LEWISHAM HOSPITAL, London, S.E.13. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER to the Department of Orthopædics and Trauma, vacant now and tenable for 1 year at a salary of £670 p.a., less £150 for residential emoluments. The medical staff of the department comprises 2 Registrars in addition to this vacancy under the direction of 2 Consultants. There is a separate establishment of Casualty Officers.

Applications, stating age, nationality, qualifications, and experience, with names of 3 referees, should be addressed to the Secretary, Lewisham Group Hospital Management Committee, Lewisham Hospital, London, S.E.13.

LONDON JEWISH HOSPITAL, Stepney Green, E.1. (130 Beds.) Applications invited for the post of RESIDENT HOUSE SURGEON, now vacant, tenable for 6 months, renewable. Salary £350, £400, or £450 p.a. according to experience, subject to deduction at the rate of £100 p.a. for board, lodging, &c.

Applications, with copies of testimonials, to the Secretary at the Hospital.

METROPOLITAN EAR, NOSE AND THROAT HOSPITAL, 14/16, Granville-place, W.1, and 4/5, Collingham-gardens, S.W.5 (a hospital of the Fulham and Kensington Group). HOUSE SURGEON required, some E.N.T. experience desirable, vacant immediately. Hospital recognised for D.L.O. Resident appointment for 6 months in first instance, possibility of reappointment for further period for suitable candidates.

Application forms (stamped addressed foolscap envelope required) from the Secretary (L.24), Fulham and Kensington Hospital Management Committee, St. Mary Abbots Hospital, Marloes-road, Kensington, W.8, to be returned not later than 3rd May, 1952.

MILE END HOSPITAL, Bancroft-road, E.1. (475 Beds.) HOUSE PHYSICIAN (first, second, or third) required for 6 months to commence duty 19th May, 1952.

Application forms, to be returned by 8th May with copies of not more than 3 testimonials, may be obtained from the Physician-Superintendent.

MILLER GENERAL HOSPITAL. (180 Beds.) (Recognised by Royal College of Physicians and Royal College of Surgeons.) Applications are invited for posts of HOUSE PHYSICIAN and HOUSE SURGEON, each for 6 months from approximately 16th May, 1952. National salary and conditions.

Full particulars and copies of testimonials to Secretary, Greenwich and Deptford Hospital Management Committee, St. Alfege's Hospital, S.E.10.

MOTHERS' HOSPITAL (Salvation Army). (Maternity— 110 Beds.) Applications are invited from registered medical practitioners (Women) for the post of RESIDENT OBSTETRIC HOUSE SURGEON (second or third post), vacant on 1st June, 1952. The post is recognised for the M.R.C.O.G., and the appointment will be for a period of 6 months.

Applications, with copies of 3 testimonials, should be sent to the Group Secretary, Hospital Management Committee, Hackney Hospital, London, E.9, by not later than 12th May, 1952, quoting reference MH/HS.

NORTH MIDDLESEX HOSPITAL AND ANNEXES, N.18. NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Obstetrics and Gynæcology (resident) at above Hospital which has 150 obstetric and 70 gynæcological beds. Recognised for M.R.C.O.G. as combined post. Appointment is subject to review after 1 year. A local charge would be made for any meals or residential amenities provided.

Applications in triplicate, stating date of birth, full details of qualifications, experience, and present appointment, grade and salary, together with 2 copies of 2 recent testimonials, should reach C. E. NICOL, Secretary, 11A, Portland-place, London, W.1, by Saturday, 10th May, 1952.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. HOUSE SURGEON (resident), general, traumatic and orthopædic surgery. 6 months appointment. Vacant 1st June, or earlier.

Applications, stating age, qualifications, experience, nationality, together with copies of recent testimonials, to Secretary of Hospital, as soon as possible.

PADDINGTON HOSPITAL, 285, Harrow-road, W.9. PADDINGTON GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON (Obstetric and Gynæcology Department) at above Hospital. The appointment to be made on 23rd May for duty on 1st June, 1952.

Applications, stating age, qualifications, experience, together with the names and addresses of 2 referees, to reach the Secretary to the Committee by 12th May, 1952.

PADDINGTON GROUP HOSPITAL MANAGEMENT COMMITTEE, 285, Harrow-road, W.9. Applications are invited for the following HOUSE PHYSICIAN appointments to be made on 23rd May for duty on 1st June, 1952 :—

National Temperance Hospital, Hampstead-road, N.W.1 ; 1 post.

Paddington Hospital, 285, Harrow-road, W.9 ; 4 posts.

Applications, stating age, qualifications, experience, together with the names and addresses of 2 referees, to reach the Secretary to the Committee by 12th May, 1952.

PADDINGTON GROUP HOSPITAL MANAGEMENT COMMITTEE, 285, Harrow-road, W.9. Applications are invited for the following HOUSE SURGEON appointments to be made on 23rd May for duty on 1st June, 1952 :—

National Temperance Hospital, Hampstead-road, N.W.1 ; 1 post.

Paddington Hospital, 285, Harrow-road, W.9 ; 2 posts.

Applications, stating age, qualifications, experience, together with the names and addresses of 2 referees, to reach the Secretary to the Committee by 12th May, 1952.

PLAISTOW HOSPITAL. Samson-street, London, E.13. (179 Beds.) Applications are invited from registered medical practitioners (Male or Female) for the appointment of RESIDENT HOUSE PHYSICIAN (House Officer, second or third post) for 6 months in the Chest Unit and Infectious Diseases Unit of this Hospital. The position offers valuable experience in both groups of diseases and is particularly useful to candidates sitting for the M.R.C.P. examination.

Candidates should send applications to the undersigned, together with copies of recent testimonials, by 30th April, 1952. M. J. HUNTLEY, Group Secretary.

West Ham Group Hospital Management Committee, Stratford, London, E.15.

PLAISTOW MATERNITY HOSPITAL, Howards-road, Plaistow, London, E.13. Applications are invited from registered medical practitioners for the appointment of RESIDENT OBSTETRIC OFFICER (House Officer, second or third post) for 6 months commencing in May, 1952. The post is recognised for the training of candidates for D.Obst.R.C.O.G.

Candidates should send applications, together with copies of recent testimonials, to the Group Secretary, West Ham Group Hospital Management Committee, Stratford, London, E.15, by 3rd May, 1952.

PRINCE OF WALES'S GENERAL HOSPITAL. (219 Beds.) TOTTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE, The Green, N.15. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER RESIDENT ANÆSTHETIST, for a period of 6 months, vacant 17th June, 1952.

Application forms from the Secretary, to be returned by 10th May, 1952.

PRINCE OF WALES'S GENERAL HOSPITAL. (219 Beds.) TOTTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE, The Green, N.15. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER RESIDENT CASUALTY OFFICER, for a period of 6 months, vacant 30th June, 1952.

Application forms from the Secretary, to be returned by 10th May, 1952.

PRINCESS BEATRICE HOSPITAL, Earl's Court, S.W.5. (101 Beds.) HOUSE PHYSICIAN, vacancy 1st June.

Applications, with 3 testimonials, to the House Governor not later than 12th May.

PUTNEY HOSPITAL, Lower Common, S.W.15. House PHYSICIAN (resident) early June.

Apply, enclosing copies of 3 recent testimonials, to Administrative Officer, by 22nd May.

ROYAL CANCER HOSPITAL, Fulham-road, London, S.W.3. Applications are invited for the post of Full-time SENIOR REGISTRAR in the Radiotherapy Department, to commence duty as soon as possible. Candidates must hold a Diploma in Medical Radiology.

Forms of application are obtainable from the House Governor to whom applications, together with copies of 3 recent testimonials, should be sent not later than 2nd May, 1952.

ROYAL NATIONAL THROAT, NOSE AND EAR HOS-PITAL, Gray's Inn-road, London, W.C.1, and Golden-square, W.1. RESIDENT HOUSE SURGEON. There will be a vacancy (second or subsequent post) on 12th May, 1952. Appointment for 6 months with salary as laid down for House Officer grades in the terms and conditions of service under the National Health Service.

Applications, stating age, qualifications, full details of previous experience (particularly in this specialty), with copies of 1–3 recent testimonials, should be sent on or before 7th May, 1952. JOHN H. YOUNG, House Governor and Secretary.

ROYAL NATIONAL THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, London, W.C.1, and Golden-square, W.1. There will be a vacancy for a HOUSE ANÆSTHETIST (resident or non-resident) to enter on duty on 1st May. The appointment will be for a period of 6 months with salary at the rate for House Officers in the National Health Service. Candidates must have had some preliminary training in anæsthesia and should preferably be working for the D.A.

Applications, giving full particulars of age, qualifications and experience, and the names of 2 referees, should be sent to the undersigned on or before 28th April, 1952.

JOHN H. YOUNG, House Governor and Secretary.

ROYAL MASONIC HOSPITAL, Ravenscourt Park, London, W.6. Applications are invited for 2 resident appointments as SURGICAL REGISTRARS, one of which will occur on the 7th July, 1952, and the other before the end of July. Salary £775 p.a., inclusive of full residential emoluments.

Applications, stating age, qualifications, past and present appointments, together with 2 recent testimonials, and also the names of 2 referees, should be received by the Secretary and House Governor at the Hospital by the first post on 15th May, by whom further information would be given on request.

SPRINGFIELD HOSPITAL MANAGEMENT COM-MITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. 3 REGISTRARS required. The Hospital is a large one and offers excellent experience in diagnosis and treatment of all forms of mental disorder including the neuroses. Every variety of modern treatment is carried out in a well-equipped treatment centre. Single accommodation available for which a deduction of £130 p.a. will be made. Candidates may visit the Hospital by arrangement.

Apply to Secretary, Springfield Hospital, Beechcroft-road, Upper Tooting, S.W.17, for application forms which should be returned, duly completed, on or before 10th May, 1952.

ST. ANN'S GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the appointment of RESIDENT HOUSE SURGEON (third post), for a period of 6 months.

Application form from the Secretary, Tottenham Group Hospital Management Committee, The Green, N.15.

ST. GEORGE-IN-THE-EAST HOSPITAL, Raine-street, Wapping, E.1. Applications are invited for the post of HOUSE SURGEON (House Officer, first, second, or third). Tenable for 6 months. Salary, &c., in accordance with national scale.

Application forms should be obtained from, and returned immediately to, the Medical Superintendent.

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for the post of RESIDENT HOUSE SURGEON to the Neurosurgical Department at the Atkinson Morley Hospital, Wimbledon. The post falls vacant on 7th June, and preference will be given to candidates who have already held a House Officer post. The successful candidate will be required to take up duty on 21st May, 1952.

Applications, together with the names of 2 referees, must be received by the undersigned not later than 5th May, 1952.

P. H. CONSTABLE, House Governor.

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for the post of HOUSE PHYSICIAN (resident) at the Victoria Hospital for Children, Tite-street, Chelsea, S.W.3, for a period of 6 months from 1st July, 1952. Applicants should have held 1 post as House Officer, and be prepared to take up duty on 12th June, 1952.

Applications, together with the names of 2 referees, should reach the undersigned by 9th May, 1952.

P. H. CONSTABLE, House Governor.

ST. JAMES' HOSPITAL, Ousseley-road, Balham, S.W.12. (660 Beds—General.) Locum REGISTRAR (anæsthetics), post now vacant.

Applications immediately, stating qualifications, experience, and the names of 2 referees, to the Group Secretary, Wandsworth Hospital Group, 14, Atkins-road, Balham, S.W.12.

ST. LEONARD'S HOSPITAL, Nuttall-street, London, N.1. (Acute General—170 Beds.) CENTRAL GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of HOUSE PHYSICIAN. The appointment is for 6 months only and includes casualty duties. The salary £350, £400, or £450 p.a., according to experience.

Applications, stating age, nationality, qualifications, and experience, and names of 2 referees, should reach the Hospital Secretary by 5th May, 1952.

ST. LEONARD'S HOSPITAL, Nuttall-street, London, N.1. (Acute general—170 Beds.) CENTRAL GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of HOUSE SURGEON. The appointment is for 6 months only and the salary £350, £400, or £450 p.a., according to experience. The Hospital is recognised for the Final F.R.C.S. (London).

Applications, stating age, nationality, qualifications, and experience, and names of 2 referees, to be forwarded to the Hospital Secretary by 5th May, 1952.

ST. MARY'S HOSPITAL, W.2. Applications are invited from suitably qualified practitioners for the post of CASUALTY PHYSICIAN. Candidates must have held an appointment as House Physician at this Hospital, or at another general hospital approved by the Board of Governors. The appointment is for a first period of 6 months, as from 26th June, 1952. The grading of this post is Senior House Officer—i.e., £670 p.a.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, and details of previous appointments, together with the names and addresses of 3 referees, should reach the undersigned by 7th May, 1952.

15th April, 1952. ALAN POWDITCH, House Governor.

ST. MARY'S HOSPITAL CHILDREN'S DEPARTMENT. PRINCESS LOUISE KENSINGTON HOSPITAL FOR CHILDREN, St. Quintin-avenue, W.10. Applications are invited for the appointment of RESIDENT HOUSE OFFICER (second or third post), vacant on 1st June, 1952, for 6 months. Recognised for the D.C.H.

Applications, together with 3 recent testimonials, should reach the undersigned not later than Friday, 2nd May, 1952.

A. C. YOUNG, Secretary.

ST. STEPHEN'S HOSPITAL AND ST. LUKE'S HOS-PITAL, Chelsea, S.W. REGISTRAR in Physical Medicine Department and Rehabilitation Unit, vacancy 1st June, wholetime, non-resident.

Application forms from the Secretary, St. Luke's Hospital, Sydney-street, Chelsea, S.W.3, returnable by 10th May.

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. House PHYSICIAN (resident). This Hospital is recognised for the purposes of the M.D.

Applications, naming 2 referees, to the Medical Superintendent immediately.

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. House OFFICER (Obstetrical and Gynæcological Department), resident. Vacancy 7th June, 1952. Post recognised for D.Obst. R.C.O.G., but not M.R.C.O.G.

Applications, naming 2 referees, to Medical Superintendent immediately.

ST. THOMAS'S HOSPITAL, London, S.E.1. Locum SENIOR REGISTRAR, Eye Department, required immediately until 31st July, 1952. 2 afternoon sessions per week—Wednesday and Friday.

Applications, including names and addresses of 3 referees, to Clerk of the Governors by 3rd May, 1952.

ST. ALFEGE'S HOSPITAL, Greenwich, S.E.10. (504 General Beds—recognised for D.A.) Applications invited for post of RESIDENT SENIOR HOUSE OFFICER (anæsthetics) for 1 year from mid-May. Salary £670, less £150 p.a. for residence. Hospital 16 minutes central London. Opportunities for study.

Applications, with copies of 3 testimonials, to Secretary, Greenwich and Deptford Hospital Management Committee at above Hospital.

ST. ALFEGE'S HOSPITAL, Greenwich, S.E.10. (504 Beds.) Applications are invited for the post of HOUSE SURGEON (general and orthopædic surgery) at the above Hospital, for a period of 6 months from an early date. Recognition by R.C.S. being sought. Salary £350–£450, according to experience, less £100 p.a. for board and lodging.

Applications, together with copies of not more than 3 recent testimonials, should reach the Secretary, Greenwich and Deptford Hospital Management Committee, at the above Hospital, as soon as possible.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy for a RESIDENT ASSISTANT PHYSICIAN (grade—Senior Registrar) on 1st July, 1952.

Full particulars and form of application, which must be returned not later than Monday, 12th May, 1952, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

WEST END HOSPITAL FOR NERVOUS DISEASES, housed at St. Charles' Hospital, Ladbroke-grove, W.10. PADDINGTON GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of Half-time SURGICAL ASSISTANT (graded a Senior House Officer) for duty at the above Hospital. Candidates should have had surgical experience, and previous neurological or neurosurgical experience would be an advantage. The appointment is to be in accordance with the terms and conditions of service for hospital medical and dental staffs.

Applications, stating age, qualifications, experience, together with the names and addresses of 3 referees, to reach the undersigned by 7th May, 1952.

C. R. JOLLY, Secretary to Committee.

285, Harrow-road, W.9.

WESTMINSTER CHILDREN'S HOSPITAL. WESTMINSTER HOSPITAL TEACHING GROUP. CASUALTY OFFICER required for 6 months from 1st July, 1952. Salary £400 or £450 p.a., according to experience, with deductions of £100 p.a. for residence.

Applications, with copies of testimonials, should be submitted by 5th May to the Assistant Secretary, Westminster Children's Hospital, Vincent-square, S.W.1.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications are invited for the post of REGISTRAR to the E.N.T. Department. The appointment is for 1 year in the first instance and previous experience in this specialty is essential. The terms and conditions of service for hospital medical and dental staffs will apply.

Applications (3 copies), with the names of 2 referees, should be sent to undersigned by 24th May, 1952.

CHARLES M. POWER, House Governor and Secretary.

WESTMINSTER HOSPITAL TEACHING GROUP. The GORDON HOSPITAL FOR RECTAL, COLONIC, AND GASTRO-INTESTINAL DISEASES. Applications are invited for the appointment of RESIDENT SURGICAL OFFICER (Registrar grade) for duty commencing as soon as possible. The appointment is for 1 year in the first instance.

Applications, with copies of 3 testimonials, to be sent to the Chief Administrative Officer, The Gordon Hospital, Vauxhall Bridge-road, S.W.1, by 2nd May, 1952.

Provincial

ACCRINGTON. VICTORIA HOSPITAL. (112 Beds.) HOUSE SURGEON required, post tenable for 6 months. Salary £350–£450 p.a., according to previous posts held, less £100 p.a. for board-residence.

Applications, giving age, nationality, qualifications, &c., accompanied by copies of 2 testimonials, to be addressed to the Secretary, Blackburn and District Hospital Management Committee, Royal Infirmary, Blackburn.

ARLESEY, BEDS. THREE COUNTIES HOSPITAL (Mental). Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (resident or non-resident). Salary £700–£1000, according to experience and qualifications. The Hospital (1350 Beds) which carries out all forms of treatment and provides facilities for research work, is conveniently situated, enabling Medical Officers to attend D.P.M. and other courses in London. Some 900 patients are admitted yearly (85% voluntary). Outpatient Clinics are held at the local general hospitals.

Application forms are available on request to the Medical Superintendent.

ALTON, HANTS. TRELOAR ORTHOPÆDIC HOSPITAL. Applications are invited from registered medical practitioners for post of Whole-time REGISTRAR. Post provides experience in orthopædic and plastic surgery and non-pulmonary tuberculosis, and includes attendances at outlying clinics. Accommodation available for single or married man.

Write to Secretary for application form. Canvassing disqualifies, but visit to Hospital welcomed.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. 2 RESIDENT HOUSE SURGEONS (Male) required at above Hospital (*a*) general surgery; (*b*) traumatic and orthopædic. 6 months appointments, both vacant April. National Health Service salary and terms of service.

Applications, stating age, nationality, qualifications, and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital, stating for which post application is being made, as soon as possible.

ASHTON, HYDE, AND GLOSSOP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the following appointments:—

Lake Hospital, Ashton-under-Lyne (600 Beds)

HOUSE PHYSICIAN, with duties at other hospitals, vacant late April.

SENIOR HOUSE OFFICER (pædiatrics), with duties at other hospitals, vacant April.

Lake Hospital, Ashton-under-Lyne (600 Beds); and **District Infirmary, Ashton-under-Lyne** (200 Beds)

HOUSE SURGEON required, vacant late April. The post is recognised for F.R.C.S. (Eng.).

Appointments are subject to Ministry of Health terms and conditions of service.

Applications, giving age, nationality, qualifications, and experience, with copies of 3 testimonials, should be forwarded to R. W. MCVITY, Group Secretary.

Astley-road, Stalybridge, Cheshire.

AYLESBURY, BUCKS. TINDAL GENERAL HOSPITAL. 2 HOUSE SURGEONS (Male or Female), first or second posts, vacant 1st and 11th June. The posts offer wide experience of general surgery with operative practice, and are recognised for F.R.C.S. The Acute Surgical Unit consists of 95 Beds. No Casualty Department.

Applications, stating age, nationality, qualifications, and experience, with 2 testimonials, to Administrative Officer.

AYLESBURY, BUCKS. STOKE MANDEVILLE HOSPITAL. HOUSE PHYSICIAN for general medical beds, first or second post, vacant now. Also required to attend Outpatient Clinics (at Royal Buckinghamshire Hospital).

Applications, stating age, nationality, qualifications, and experience, with 2 testimonials, to the Administrative Officer.

BANBURY, OXON. HORTON GENERAL HOSPITAL. (170 Beds.) Applications are invited for the following posts:—

SENIOR HOUSE OFFICER (Physician) required middle of May. Salary £670 p.a., less £100 for residential emoluments.

HOUSE PHYSICIAN required immediately. Salary from £350 in accordance with experience.

The posts provide experience in general medical and children's wards, and in separate Infectious Diseases Unit. 3 other residents.

Applications, stating age, nationality, qualifications, and names of 2 referees, to the Secretary.

BANGOR. C. & A. GENERAL HOSPITAL. Applications are invited for the appointment of RESIDENT HOUSE PHYSICIAN (first or subsequent post) at the above Hospital. The appointment is for a period of 6 months.

Applications, stating age, experience, and qualifications, together with the names and addresses of 2 referees, should be forwarded within 10 days of the appearance of this advertisement to the Secretary, Caernarvon and Anglesey Hospital Management Committee, Plas Gwyn, Ffriddoedd-road, Bangor, N. Wales.

BARNET GENERAL HOSPITAL, Barnet, Herts. RESIDENT HOUSE PHYSICIAN required immediately.

Applications, stating age, qualifications, and experience, and names of 2 referees, to be sent to the Hospital Secretary.

BARNET GENERAL HOSPITAL, Barnet, Herts. House SURGEON (general surgery) required immediately.

Applications, stating age, nationality, qualifications, and experience, with copies of 3 recent testimonials, to be sent to the Hospital Secretary.

BARNET GENERAL HOSPITAL, Barnet, Herts. RESIDENT SENIOR HOUSE OFFICER (E.N.T. and Eye Departments) required immediately.

Applications, stating age, nationality, qualifications, and experience, with copies of 2 recent testimonials, to be sent to the Hospital Secretary.

BARNSTAPLE. NORTH DEVON INFIRMARY. (110 Beds.)

SENIOR HOUSE SURGEON.

HOUSE PHYSICIAN.

Applications to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple, North Devon.

BATLEY. THE GENERAL HOSPITAL, Carlinghow-hill, BATLEY, YORKS. (99 Beds.) Applications are invited for the appointment of:—

HOUSE SURGEON (E.N.T. and orthopædic).

HOUSE SURGEON (ophthalmic and general surgery).

This General Hospital will shortly provide all the inpatient treatment for the group in the specialties of orthopædics, E.N.T., and ophthalmology, in addition to some general surgery, together with the usual outpatient clinics.

Applications, stating age, qualifications, and experience, together with recent testimonials, should be submitted immediately to the Secretary, Dewsbury, Batley and Mirfield Hospital Management Committee, 20, Oxford-road, Dewsbury.

BANSTEAD, SURREY. CUDDINGTON HOSPITAL. (126 Beds—at present 18–32 infectious diseases beds, 25 surgical convalescent beds, and 24 tuberculosis beds.) RESIDENT HOUSE OFFICER required to work under the various Consultants. Cases admitted are mainly acute of the types shown above. Post suitable for anyone reading for a higher qualification. Vacant 26th April, 1952.

Applications, stating age, qualifications, and experience, with copies of 3 recent testimonials, to be sent immediately to Secretary, Epsom Group Hospital Management Committee, Epsom District Hospital, Dorking-road, Epsom, Surrey.

BATH CLINICAL AREA. South-Western Regional Hospital Board. Applications are invited from registered medical practitioners in General Practice for the appointment of CLINICAL ASSISTANT in General Medicine to undertake 2 weekly sessions at the Royal United Hospital, Bath. The successful applicant will work under the general direction of the Consultant Physicians attached to the Bath Hospitals Group. Previous experience in general medicine is desirable. Payment will be at the rate of £175 p.a. per weekly 3½-hour session. The appointment will be held for 1 year, and duties will commence on 5th July, 1952.

Applications (10 copies), stating date of birth, qualifications, and experience, together with 10 copies of 2 testimonials, and the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, "Parklands," 27, Tyndalls Park-road, Bristol, 8, not later than 12th May, 1952.

BATH CLINICAL AREA. South-Western Regional Hospital Board. Applications are invited from registered medical practitioners in General Practice for the appointment of CLINICAL ASSISTANT in Pædiatrics to undertake 1 weekly session at the Manor Hospital, Bath. The successful applicant will work under the general direction of the Consultant Pædiatrician attached to the Bath Hospitals Group. Previous experience in pædiatrics is desirable. Payment will be at the rate of £175 p.a. per weekly 3½-hour session. The appointment will be held for 1 year, and duties will commence on 5th July, 1952.

Applications (10 copies), stating date of birth, qualifications, and experience, together with 10 copies of 2 testimonials, and the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, "Parklands," 27, Tyndalls Park-road, Bristol, 8, not later than 12th May, 1952.

BATH. ROYAL NATIONAL HOSPITAL FOR RHEUMATIC DISEASES. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER in Rheumatology. The Hospital is recognised for Part II of the Diploma of Physical Medicine.

Applications, stating age, qualifications, and experience, with 3 recent testimonials, to be forwarded to the undersigned as soon as possible.

J. LAWRENCE MEARS, Secretary,
Bath Hospital Management Committee.

Manor Hospital, Bath.

BEDFORD GENERAL HOSPITAL (South Wing). 2 RESIDENT HOUSE SURGEONS required immediately. These appointments are recognised by the Royal College of Surgeons and offer exceptional opportunities for general experience in a busy acute surgical unit.

Applications, stating age, nationality, qualifications, previous appointments, together with copies of 2 testimonials, should be addressed to the Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BILLERICAY. ST. ANDREW'S HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER AND CASUALTY OFFICER at the above Hospital. The appointment, which is vacant immediately, is for 6 months in the first instance.

Applications, together with copies of not more than 3 recent testimonials, should be forwarded to the undersigned as soon as possible.

G. E. WHYTE, Secretary,
South East Essex Hospital Management Committee.

Thurrock Hospital, Grays, Essex.

BILLERICAY. ST. ANDREW'S HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (Anæsthetist), resident or non-resident, based at above Hospital and for duties in all the hospitals in the Group. The post which becomes vacant on 1st May, 1952, is for 6 months in the first instance.

Applications, together with copies of not more than 3 recent testimonials, should be forwarded to the undersigned as soon as possible.

G. E. WHYTE, Secretary,
South East Essex Hospital Management Committee.

Thurrock Hospital, Grays, Essex.

BILLERICAY. ST. ANDREW'S HOSPITAL. Applications are invited from registered medical practitioners for the post of HOUSE SURGEON for the General Surgery and Orthopædic Departments of the above Hospital. These departments of this Hospital provide interesting and active traumatic experience. Resident. The post which is vacant immediately is for 6 months in the first instance.

Applications, together with copies of not more than 3 recent testimonials, should be forwarded to the undersigned as soon as possible.

G. E. WHYTE, Secretary,
South East Essex Hospital Management Committee.

Thurrock Hospital, Grays, Essex.

BISHOP'S STORTFORD, HERTS. HAYMEADS HOSPITAL. (350 occupied beds. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for the resident appointment of SENIOR HOUSE OFFICER (surgical). Salary £670 p.a., less £130 p.a. in respect of residential emoluments. The appointment is for a period of 1 year, duties to commence as soon as possible.

Applications, stating nationality, age, qualifications, and experience, with copies of recent testimonials, or names of referees, to the Secretary, Hertford Group Hospital Management Committee, Hertford County Hospital, Hertford, Herts.

BISHOP'S STORTFORD, HERTFORDSHIRE. HAYMEADS HOSPITAL. (350 occupied beds. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications invited from registered medical practitioners for a RESIDENT HOUSE OFFICER (surgical), first or second post held. Salary £350–£400 p.a., plus special grant of £50 p.a., less £100 p.a. for residential emoluments. Appointment to commence immediately.

Applications, stating age, nationality, qualifications, and experience, with copies of recent testimonials or the names of referees, should be sent as soon as possible to the Administrative Officer.

BISHOP'S STORTFORD, HERTFORDSHIRE. HAYMEADS HOSPITAL. (350 occupied beds. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for the resident appointment of HOUSE OFFICER (medical), Male or Female, first, second, or third post held, with primary attachment to the Pædiatric Ward of 24 Beds, and other duties in connection with 8 skin beds and the Casualty Department. Salary £350–£450 p.a., less £100 p.a. for residential emoluments. Appointment to commence 1st May, 1952, for a period of 6 months.

Applications, stating nationality, age, qualifications, and experience, with copies of testimonials or the names of 2 referees, should be sent to the Administrative Officer as soon as possible.

BIRMINGHAM. RUBERY HILL HOSPITAL, Rubery. (950 Beds.) BIRMINGHAM NO. 6 GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female), resident or non-resident. Previous psychiatric experience an advantage but not essential. National Health Service terms and conditions of service.

Applications, stating name, age, nationality, qualifications, present and previous appointments, and providing the names and addresses of 3 referees, to be sent to the Medical Superintendent as soon as possible.

BIRMINGHAM, 31. HOLLYMOOR MENTAL HOSPITAL, NORTHFIELD. (639 Beds.) BIRMINGHAM NO. 6 GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female), resident or non-resident. Previous psychiatric experience an advantage but not essential. National Health Service terms and conditions of service.

Applications, stating name, age, nationality, qualifications, present and previous appointments, and providing the names and addresses of 3 referees, to be sent to the Medical Superintendent as soon as possible.

BIRMINGHAM REGIONAL HOSPITAL BOARD. Applications invited for the following whole-time appointments :—

(*a*) SURGICAL REGISTRAR, South Warwickshire Group ; duties at Stratford-on-Avon Hospital. Resident appointment. Experience in specialty essential. Possession of higher qualification an advantage.

(*b*) REGISTRAR in Tuberculosis, Birmingham (Sanatoria) Group ; duties at Romsley Hill Sanatorium (130 Beds—including 24 Beds for treatment of tuberculous patients with diabetes). Successful candidate must be resident. Experience in general medicine desirable.

Appointments subject to National Health Service superannuation regulations.

Applications (10 copies), stating name, age, nationality, qualifications, present and previous appointments, and details of 3 referees, to Secretary, 10, Augustus-road, Birmingham, 15, before 12th May. Candidates may visit the hospitals concerned.

BIRMINGHAM. SORRENTO AND LORDSWOOD MATERNITY HOSPITALS. GROUP 25 BIRMINGHAM (SELLY OAK) HOSPITAL MANAGEMENT COMMITTEE. OBSTETRIC HOUSE SURGEON, 9 months appointment, recognised for the D.Obst.R.C.O.G. Appointment vacant 1st June.

Applications to the Obstetrician, Sorrento Maternity Hospital, Moseley, Birmingham, 13, immediately.

BIRMINGHAM AND MIDLAND EAR AND THROAT HOSPITAL, Edmund-street, BIRMINGHAM, 3. 2 HOUSE SURGEON vacancies occur at above Hospital (76 Beds).

Applications, stating age, qualifications, nationality, and experience, accompanied by copies of 2 recent testimonials, to the Secretary, Hospital Management Committee, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER in the Casualty Department. This is a 6 or 12 months appointment.

Applications, stating age, qualifications, and experience, accompanied by copies of 3 recent testimonials, to the Secretary.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE BIRMINGHAM MATERNITY HOSPITAL, Lovedaystreet, BIRMINGHAM, 4. HOUSE SURGEON required. Salary £400 or £450 p.a. according to experience. The appointment is for a period of 6 months and is recognised for the D.Obst. R.C.O.G. Duties commence 1st July, 1952.

Application forms can be obtained from the undersigned, and should be returned not later than 3rd May, 1952.

G. A. PHALP, Secretary,
The United Birmingham Hospitals.

The Queen Elizabeth Hospital, Edgbaston, Birmingham, 15.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. HOUSE OFFICER (surgical) required for 6 months, to commence duty as soon as possible. The duties will be mainly general surgery, but the Officer will have, in addition, the opportunity of undertaking a certain amount of special surgery.

Forms of application may be obtained from the House Governor and should be returned within 10 days of the appearance of this advertisement.

G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the appointment of AURAL REGISTRAR (non-resident), in the grade of Registrar, vacant 1st May, 1952, or as soon after as possible, for 1 year. Preference will be given to candidates who are Fellows of the Royal College of Surgeons and/or hold the diploma in Child Health.

Forms of application may be obtained from the House Governor, and should be returned within 10 days of the appearance of this advertisement.

G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER (clinical pathology), vacant on 1st June, 1952. Applicants should have held resident appointments in a children's hospital, or a children's department of a general hospital, and preference will be given to those wishing to concentrate on pathology and to those with a higher qualification. The successful applicant will be required to work in the Clinical Pathological Department.

Forms of application may be obtained from the House Governor and should be returned not later than 3rd May, 1952.

G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE BIRMINGHAM AND MIDLAND HOSPITALS FOR WOMEN (Incorporating the Hospital for Women and The Birmingham Maternity Hospital), Showell Green-lane, SPARKHILL, BIRMINGHAM, 11. Applications are invited for the following appointments, vacant on 1st July, 1952 :—

(*a*) OBSTETRICAL AND GYNÆCOLOGICAL REGISTRAR (Senior Registrar grade). The appointment will be for 1 year in the first instance and subject to annual review. The successful candidate may subsequently be required to spend not more than 2 years in a selected Hospital of the Birmingham Regional Hospital Board in accordance with an arrangement for interchange of Registrars agreed between the 2 Boards. Candidates must be registered medical practitioners and should hold the M.R.C.O.G. Diploma.

(*b*) 2 OBSTETRICAL AND GYNÆCOLOGICAL REGISTRARS. Each Registrar may be required to alternate duty at the Hospital for Women and the Maternity Hospital for specified periods. The posts are recognised for the examinations of the Royal College of Obstetricians and Gynæcologists, and applicants should have held house appointments and at least 1 obstetrical and gynæcological post.

All the appointments may be resident or non-resident by arrangement.

Forms of application may be obtained from, and should be returned immediately to, the House Governor at the above address.

G. A. PHALP, Secretary,
The United Birmingham Hospitals.

The Queen Elizabeth Hospital, Edgbaston,
Birmingham, 15, 17th April, 1952.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the appointment of SURGICAL REGISTRAR (Senior Registrar grade) in the Queen Elizabeth Hospital, to begin duties on 1st July, 1952. The appointment will be for 1 year in the first instance and subject to annual review. The successful candidate may subsequently be required to spend not more than 2 years in a selected hospital of the Birmingham Regional Hospital Board in accordance with an arrangement for the interchange of registrars agreed between the two Boards. Candidates must be registered medical practitioners and should possess the F.R.C.S.

Forms of application may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, and should be returned not later than 12th May, 1952.

BEVERLEY, E. YORKS. WESTWOOD HOSPITAL. SENIOR ORTHOPÆDIC HOUSE SURGEON required immediately. The post is recognised for the F.R.C.S. Salary £670 p.a., less a charge of £140 for board and lodging.

Applications, stating age, qualifications, and experience, together with copies of 3 references, to the Secretary.

BEVERLEY, YORKS. BROADGATE HOSPITAL. House PHYSICIAN required at above Mental Hospital. Salary £350–£450.

Applications to Secretary, Westwood Hospital, Beverley, Yorks.

BEXHILL-ON-SEA. BEXHILL HOSPITAL. (62 Beds.) 2 HOUSE SURGEONS required. National scale of salary.

Apply to Hospital Administrator.

BLACKBURN. QUEEN'S PARK HOSPITAL. (650 Beds.) HOUSE PHYSICIAN required. National Health Service salary and conditions.

Applications, accompanied by copies of 2 testimonials or names of referees, to the Secretary, Blackburn and District Hospital Management Committee, Royal Infirmary, Blackburn.

BLACKPOOL. VICTORIA HOSPITAL.

(1) SENIOR HOUSE OFFICER, E.N.T. Department. Post recognised for D.L.O. and F.R.C.S.

(2) ASSISTANT RESIDENT SURGICAL OFFICER with responsibility for Casualty Department. Senior House Officer grade. Post recognised for F.R.C.S.

(3) HOUSE OFFICER, Anæsthetics Department. Post recognised for D.A.

Ministry of Health salary and conditions of service.

Applications, with references, should be sent to the Hospital Secretary, Victoria Hospital, Blackpool.

BLACKPOOL. VICTORIA HOSPITAL. (339 Beds.) BLACKPOOL AND FYLDE HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICERS (2) required for Surgical Units, resident, vacant 4th June, 1952. Posts are recognised for F.R.C.S. Ministry of Health salary and conditions of service.

Applications should be sent to the Hospital Secretary.

BOURNEMOUTH AND EAST DORSET HOSPITA

MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of RESIDENT MEDICAL REGISTRAR at the Poole General and St. Mary's Hospitals, Poole. (194 acute beds, 110 geriatric beds). The post is tenable for 1 year in the first instance, to commence on 25th July, 1952.

Forms of application, obtainable from Group Secretary, Bournemouth and East Dorset Hospital Management Committee, Royal Victoria Hospital, Bournemouth, should be returned to him, duly completed, within 14 days of the appearance of this advertisement.

BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Locum SENIOR REGISTRAR (anæsthetics) required immediately for a period of 5–6 months, non-resident (£1000–£1300 p.a.).

Applications to Deputy Hospital Secretary, Royal Victoria Hospital, Bournemouth.

BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Locum THORACIC REGISTRAR required immediately for an indefinite period, non-resident (£775 p.a.).

Applications to Deputy Hospital Secretary, Royal Victoria Hospital, Bournemouth.

BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Locum HOUSE PHYSICIAN required for period of 1 month from 16th May, resident (salary scale £350–£450 p.a.).

Applications to Deputy Hospital Secretary, Royal Victoria Hospital, Bournemouth.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Locum REGISTRAR to the Obstetric and Gynæcological Department required for an indefinite period, commencing end of April. The appointment will probably be for some months and is non-resident (£775 p.a.).

Applications to the Deputy Hospital Secretary.

BRIGHTON, 7. ROYAL SUSSEX COUNTY HOSPITAL. (300 Beds.) RESIDENT ANÆSTHETIST (House Officer status) required at the above Hospital, vacant early May. Recognised for D.A.

Applications, with full details of experience, &c., together with the names and addresses of 2 referees, to be sent to the Administrative Officer of the Hospital within 7 days of the appearance of this advertisement.

BRIGHTON, 7. SUSSEX EYE HOSPITAL. (56 Beds.) BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE. SECOND HOUSE SURGEON required at the above Hospital, vacant 15th May, 1952. Recognised for D.O.

Applications, with full details of age, experience, &c., together with the names and addresses of 2 referees, to be sent to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7, as soon as possible.

BRISTOL (near). WINFORD ORTHOPÆDIC HOSPITAL. (235 Beds.) SENIOR HOUSE OFFICER. Applications are invited from registered medical practitioners to fill vacancy at end of April, 1952. Position tenable for 12 months or longer. Salary £670 p.a. Post resident or non-resident. (Hospital bus service to and from Bristol.)

Apply, stating age, qualifications, and experience, with copies of testimonials, to the undersigned as soon as possible.

E. N. ROPER, Secretary-Administrator.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. FRENCHAY HOSPITAL (470 staffed beds, expanding). HOUSE SURGEON (General Surgery Wards).

Applications, with full particulars, should be addressed to the Secretary, Frenchay Hospital, quoting G.S.F.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE.

Bury General Hospital (Acute General Hospital, 183 Beds, with Postoperative Unit)

SENIOR HOUSE OFFICER (surgical) required. Post recognised for F.R.C.S.

HOUSE PHYSICIAN for approximately 25 Beds, with some pædiatric work included.

Florence Nightingale Hospital and Aitken Sanatorium (I.D. 96 Beds ; T.B. 94 Beds)

HOUSE PHYSICIAN.

Fairfield General Hospital

JUNIOR HOSPITAL MEDICAL OFFICER for psychiatric and geriatric cases.

Applications are invited for the above posts and should indicate age, nationality, qualifications, and experience, and should be sent to the undersigned as soon as possible.

H. WILKINSON, Secretary to the Committee.

Bury General Hospital, Bury, Lancs.

BURY ST. EDMUND'S. WEST SUFFOLK GENERAL HOSPITAL. (289 Beds.) WEST SUFFOLK HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments :—

(*a*) HOUSE SURGEON (first or second post) for General Surgical duties. Post is recognised for the F.R.C.S.

(*b*) HOUSE PHYSICIANS (first or second posts) for (i) general medicine, (ii) pædiatric and general medicine.

National Health Service terms and conditions of service and salary apply. Appointments initially for 6 months. Post (*a*) vacant late June, and posts (*b*) vacant June.

Applications, including the names of 3 referees, to the Hospital Secretary.

BRADFORD ROYAL EYE AND EAR HOSPITAL. House SURGEON (E.N.T.), now vacant. Hospital recognised for D.L.O. and F.R.C.S. Salary £350–£450 p.a., less £100 p.a. residential emoluments.

Applications, stating age, nationality, qualifications, and experience, with copy testimonials to Secretary, Bradford Royal Infirmary.

BRADFORD ROYAL INFIRMARY/ST. LUKE'S HOSPITAL, BRADFORD. SENIOR HOUSE OFFICER (dermatology), vacant 1st June. Salary £670 p.a., less £130 p.a. residential emoluments.

Applications, stating age, nationality, qualifications, and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT MEDICAL OFFICER (Senior House Officer grade), vacant on 20th May, 1952, and tenable for 12 months. The successful candidate will be required to reside at the Hulton Hospital (144 Beds), and the duties will include responsibility for infectious diseases and dermatological cases at the Hospital and may include medical outpatients and inpatients experience in the general hospitals of the Group. Previous pædiatric experience would be an advantage but is not essential. Married quarters may be provided by arrangement, if required, at an agreed charge.

Applications, stating age, nationality, qualifications, and experience, together with the names of 2 persons to whom reference may be made, to be sent immediately to the undersigned at the Royal Infirmary, Bolton.

H. P. TRAVIS, Secretary.

BOLTON DISTRICT GENERAL HOSPITAL. (521 Beds.) Required, RESIDENT SENIOR HOUSE OFFICER for general surgical duties. Post vacant immediately and tenable for 12 months.

Applications, stating age, nationality, qualifications, and experience, together with the names of 2 persons to whom reference may be made, to be sent immediately to the undersigned at the Royal Infirmary, Bolton.

H. P. TRAVIS, Secretary,
Bolton and District Hospital Management Committee.

CAERNARVON AND ANGLESEY HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments :—

C. & A. General Hospital, Bangor
HOUSE SURGEON (resident).
HOUSE SURGEON (resident) for casualties and Special Department.

Eryri General Hospital, Caernarvon
HOUSE SURGEON (resident).

The appointments are for a period of 6 months. Salary and conditions of service in accordance with those approved by the Ministry of Health for first or subsequent posts.

Applications, stating age, experience, and qualifications, together with the names and addresses of 2 referees, to be forwarded within 10 days of the appearance of this advertisement to the Secretary, Plas Gwyn, Ffriddoedd-road, Bangor, N. Wales.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (265 Beds.) CANTERBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. GYNÆCOLOGICAL HOUSE SURGEON required at Highland Court annexe, which is a new unit of 30 gynæcological beds situated 3 miles from the above Hospital, with all ancillary services available. 6 months appointment. Post now vacant. National Health Service salary and conditions.

Applications to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (265 Beds.) CANTERBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following posts :—

(*a*) OBSTETRIC HOUSE SURGEON, becomes vacant at the end of May, and is recognised for the D.Obst.R.C.O.G.

(*b*) E.N.T. AND EYE HOUSE SURGEON, becomes vacant at the end of May, and is recognised for the D.L.O. and D.O.M.S. examinations.

(*c*) PÆDIATRIC HOUSE PHYSICIAN. This post includes experience in the care of the newborn and in preventive medicine, and is now vacant.

National Health Service salary and conditions.

Applications to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY (near). ST. AUGUSTINE'S HOSPITAL, CHARTHAM, near CANTERBURY. Applications are invited by the Management Committee of this Hospital for Mental and Nervous Disorders, from registered practitioners (Male or Female) for the post of SENIOR HOUSE OFFICER for tenure of 1 year. Salary £670 p.a. Quarters available in the Hospital for single person Charge of £150 p.a. for full board, &c.

Apply to the Medical Superintendent, stating nationality, age, sex, qualifications and experience, and giving names of 3 referees.

CARDIFF CITY ISOLATION HOSPITAL. (219 Beds.) HOUSE OFFICER required at above Hospital. Excellent experience in treatment of tuberculous meningitis, miliary tuberculosis, and common infectious diseases.

Applications, with names for references, to Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. THE UNITED CARDIFF HOSPITALS. The Board of Governors invites applications for the appointment of REGISTRAR in the Professorial Medical Unit at the Cardiff Royal Infirmary.

Application forms, which should be returned by 10th May, can be obtained from the undersigned.

ARNOLD TUNSTALL,
Secretary and Principal Administrative Officer,
The United Cardiff Hospitals.
Cardiff Royal Infirmary, Cardiff.

CHORLEY AND DISTRICT HOSPITAL, Lancs. RESIDENT SURGICAL OFFICER (Junior Hospital Medical Officer grade) required to work under the supervision of the Consultant Surgeons from the Preston Royal Infirmary.

SURGICAL HOUSE OFFICER also required for this Hospital.

Please apply to Secretary, Preston and Chorley Hospital Management Committee, Royal Infirmary, Preston.

H. HILL, Secretary.

CARSHALTON, SURREY. ST. HELIER HOSPITAL ST. HELIER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER to the Obstetric and Gynæcological Departments (108 Obstetric Beds and 30 Gynæcological Beds), vacant 16th June. Post recognised for M.R.C.O.G.

Applications, stating age, qualifications, and experience, with a copy of 2 testimonials, and the name and address of 1 referee, should be sent to Group Secretary, St. Helier Hospital Management Committee, Carshalton, Surrey, within 10 days of the appearance of this advertisement.

CHELMSFORD AND ESSEX HOSPITAL. (163 Beds.) Applications are invited for the post of HOUSE SURGEON (resident). Post will become vacant on 15th May. This post offers good surgical experience and is recognised for the F.R.C.S.

Applications, together with 2 recent testimonials, to the Secretary, Chelmsford Group Hospital Management Committee, London-road, Chelmsford, Essex.

CHELTENHAM GENERAL EYE AND CHILDREN'S HOSPITAL. (CHILDREN'S DEPARTMENT.) Applications are invited for the post of RESIDENT MEDICAL OFFICER (second or subsequent post), for the Children's Department (50 Beds). The appointment which is recognised for candidates entering for the D.C.H., offers scope for wide experience in all departments of pædiatrics, surgical cases, and attendance at Outpatient Departments at the General Hospital. Previous hospital experience in pædiatrics is desirable. The appointment will be for a period of 6 months in the first instance.

Applications, together with 3 testimonials, should be addressed immediately to S. T. DAVIS, Group Secretary.

General Hospital, Cheltenham.

CHESTERFIELD ROYAL HOSPITAL. Sheffield Regional HOSPITAL BOARD. Applications are invited from registered medical practitioners for the whole-time post of MEDICAL REGISTRAR to the above Hospital. Single accommodation is available if required. The appointment is for 1 year in the first instance and may be renewed for a further year.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10, to arrive not later than 12th May, 1952.

CHESTERFIELD ROYAL HOSPITAL. (322 Beds.) CASUALTY OFFICER (Senior House Officer) and CASUALTY OFFICER (House Officer) required immediately. Appointments tenable for 12 and 6 months respectively. Ministry of Health salaries and conditions of service.

Apply— M. H. BOONE, Secretary,
Chesterfield Hospital Management Committee.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 Beds.) RESIDENT HOUSE SURGEON required for 6 months appointment. National scale for first, second, or third post. 6 Residents, including R.S.O. and 3 House Surgeons. Vacant shortly.

Applications to Senior Administrative Officer of Hospital as soon as possible.

COVENTRY AND WARWICKSHIRE HOSPITAL. (346 Beds.) HOUSE PHYSICIAN required (44 general medical beds), vacant 1st May. Post offers very good experience in general medicine.

Applications to the Secretary, Group 20 Hospital Management Committee, Coventry and Warwickshire Hospital, Coventry.

COVENTRY AND WARWICKSHIRE HOSPITAL. (346 Beds.) SENIOR HOUSE SURGEON required for Central Accident Department. Post vacant mid-May.

Applications to the Secretary, Group 20 Hospital Management Committee, Coventry and Warwickshire Hospital, Coventry.

COVENTRY AND WARWICKSHIRE HOSPITAL. ASSISTANT PATHOLOGIST (Junior Hospital Medical Officer status) required for duties mainly at the Group Laboratory. Good opportunity for experience in all branches of specialty. Salary £700–£50–£1000 p.a.

Applications, with full details, and names of 2 referees, to the Secretary, Group 20 Hospital Management Committee, Coventry and Warwickshire Hospital, Coventry.

COLCHESTER. ESSEX COUNTY HOSPITAL. (192 Beds.) Applications are invited for the post of HOUSE OFFICER (surgical) first, second, or third post, tenable for 6 months from 5th May. Salary in accordance with the terms of service issued by the Ministry of Health.

Applications, with copies of 3 recent testimonials, should be forwarded to the Secretary, Colchester Group Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

COTTINGHAM, E. YORKS. House Officer for Castle Hill (221 Beds), to work under supervision of Consultant Chest Physician. Sanatorium part of group with major thoracic surgery and mass-radiography units and laboratory facilities.

Application forms from Secretary, Hull B Group, De la Pole Hospital, Willerby, E. Yorks.

DARLINGTON MEMORIAL HOSPITAL. Applications are invited from Male or Female practitioners for the appointment of ORTHOPÆDIC SENIOR HOUSE OFFICER (resident or non-resident), to commence forthwith. Salary £670 p.a.

Apply, with references, stating age and experience, to—
G. W. BECKWITH, Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. Derby AREA NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the following appointments :—

SENIOR HOUSE OFFICER (ophthalmic), vacant 1st June, 1952.

HOUSE OFFICER (ophthalmic), vacant 1st July, 1952.

Posts recognised for F.R.C.S.

Applications, stating full details, together with copies of 2 recent testimonials, should be sent as soon as possible to Secretary at the Infirmary.

DERBY. DERBYSHIRE HOSPITAL FOR SICK CHILDREN. (84 Beds.) DERBY AREA NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of HOUSE SURGEON, vacant immediately. Post recognised for D.C.H.

Applications, stating age, qualifications, and experience, with copies of 2 testimonials, should be forwarded immediately to the Secretary, No. 1 Hospital Management Committee, Babington-lane, Derby.

DENBIGH. THE NORTH WALES HOSPITAL FOR NERVOUS AND MENTAL DISORDERS. JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER required. Flat available, suitable as single quarters or for married couple without children. The Hospital has modern treatment facilities and is associated under 1 Committee with the Child Guidance Service and Mental Deficiency Institutions in North Wales.

Applications with names of 2 referees to the Medical Superintendent.

SIDNEY L. FROST,
Secretary to the Management Committee.

DEWSBURY. STAINCLIFFE GENERAL HOSPITAL, Healds-road, DEWSBURY, YORKS. (316 Beds.) Applications are invited for the post of RESIDENT SURGICAL OFFICER (Senior House Officer grade) vacant 5th May, 1952. The Hospital is recognised for the F.R.C.S., and this post offers excellent experience in general surgery.

Applications, stating age, nationality, qualifications, and experience, together with copies of recent testimonials, should be submitted to the Administrative Officer at the above address.

DOVER. ROYAL VICTORIA HOSPITAL. Applications are invited from registered medical practitioners (Male) for the post of SENIOR HOUSE SURGEON. Applicants should have held at least 3 hospital appointments. The post is recognised by the Royal College of Surgeons. The salary will be £670 a year and will be for 1 year in the first instance. A deduction of £130 a year will be made in respect of residential emoluments.

Applications, stating age, qualifications, experience, and the names and addresses of 2 referees, to the Secretary, South East Kent Hospital Management Committee, "Ash-Eton," Radnor-park West, Folkestone.

DOVER. ROYAL VICTORIA HOSPITAL. Junior House SURGEON required immediately at the above Hospital. Salary £350 or £400 a year, less £100 a year for residential emoluments.

Applications, stating age, qualifications experience, and the names and addresses of 2 referees, to the Secretary, South East Kent Hospital Management Committee, "Ash-Eton," Radnor-park West, Folkestone.

DRIFFIELD, YORKS. NORTHFIELD SANATORIUM. RESIDENT SENIOR HOUSE OFFICER (medical) required at the above Sanatorium, which has accommodation for 80 adult cases of pulmonary tuberculosis. Salary £670 p.a.

Applications, stating age, qualifications, and experience, together with 3 references, to the Secretary, Westwood Hospital, Beverley, Yorks.

DRIFFIELD. EAST RIDING GENERAL HOSPITAL. HOUSE PHYSICIAN required, post now vacant. Duties to include medical wards, outpatients, and anæsthetics. Salary £350–£450 p.a.

Detailed applications, with copies of references, to the Secretary, Westwood Hospital, Beverley, Yorks.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP. BIRMINGHAM REGION. Applications invited from registered practitioners for following appointments :—

The Guest Hospital, Dudley (154 Beds)
HOUSE SURGEON, post now vacant.

Corbett Hospital, Stourbridge (106 Beds)
CASUALTY OFFICER, post now vacant.
SENIOR HOUSE OFFICER (resident), surgical, post now vacant. Salary £670 p.a., less £150 p.a. in respect of residential emoluments.

Prestwood Sanatorium (200 Beds)
SENIOR HOUSE OFFICER (resident), post now vacant. Salary £670 p.a., less £150 p.a. for residential emoluments.

Wordsley Hospital, near Stourbridge (450 Beds)
SENIOR HOUSE OFFICER (resident Anæsthetist), post now vacant. Salary £670 p.a. less £150 p.a. in respect of residential emoluments.

Applications, stating age, experience, with copies of 3 recent testimonials, to—

H. RAYMOND HURST,
Secretary to the Management Committee.

The Guest Hospital, Dudley.

EDGWARE GENERAL (formerly Redhill County) HOS-PITAL, EDGWARE, MIDDLESEX. RESIDENT HOUSE PHYSICIAN, post vacant 11th June, 1952. Salary £400–£450 p.a., according to experience.

Applications, stating age, qualifications, experience, and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 10th May, 1952.

EDGWARE GENERAL (formerly Redhill County) HOS-PITAL, EDGWARE, MIDDLESEX, and ANNEXE at BUSHEY. 2 RESIDENT OBSTETRIC HOUSE SURGEONS, posts vacant 23rd May and 7th June, 1952. Salary £400–£450 p.a. according to experience.

Applications, stating age, qualifications, experience, and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 10th May, 1952.

EPPING. ST. MARGARET'S HOSPITAL. (485 Beds —recognised for D.Obst.R.C.O.G.) Applications are invited for the post of SENIOR HOUSE OFFICER (obstetrics) becoming vacant at the beginning of June, at the above Hospital.

Applications, with copies of 2 recent testimonials, to be forwarded to the Secretary, Epping Group Hospital Management Committee, St. Margaret's Hospital, Epping, by 2nd May, 1952.

EPPING. ST. MARGARET'S HOSPITAL. (485 Beds.) Applications are invited for the resident post of SENIOR HOUSE OFFICER (surgery) for Casualty and Orthopædic work. Large General Hospital with busy Outpatient Department. Situated within 20 miles of London with good travelling facilities.

Applications, with copies of 2 recent testimonials, to reach the Secretary, Epping Group Hospital Management Committee, St. Margaret's Hospital, Epping, Essex, by 2nd May, 1952.

EPSOM GROUP HOSPITAL MANAGEMENT COM-MITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for Whole-time REGISTRAR in Chest Medicine to the Epsom and Dorking Chest Clinics. Duties will include sessions at both Clinics and charge of 24 Beds for pulmonary tuberculosis at Cuddington Hospital under the supervision of the Consultant Chest Physician. The successful candidate will be required to live in the vicinity of the Hospital or resident quarters are available.

Applicants may visit units on request to Group Secretary, Epsom District Hospital, Dorking-road, Epsom, from whom application forms may be obtained (send stamped addressed foolscap envelope) for completion and return by 10th May, 1952.

EPSOM, SURREY. WEST PARK HOSPITAL. South WEST METROPOLITAN REGIONAL HOSPITAL BOARD. WEST PARK HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for appointment of REGISTRAR in Psychiatry at above Hospital, for all stages of nervous and mental disorders. Candidates may be of either sex. Single residential quarters are available.

Applications (5 copies) should be made on forms to be obtained from the Secretary to the Hospital Management Committee at the Hospital, to whom they should be returned within 14 days of the appearance of this advertisement.

EDINBURGH. PRINCESS MARGARET ROSE HOS-PITAL FOR CRIPPLED CHILDREN. Applications are invited from registered medical practitioners for an appointment of HOUSE SURGEON in the above Hospital for 6 months, commencing immediately. The appointment is resident at National Health Service scale of salary.

Applications, stating date of birth, qualifications, and experience, and the names of 2 referees, to be sent immediately to the Medical Superintendent, 18, Rillbank-terrace, Edinburgh, 9.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointments of RESIDENT HOUSE SURGEONS (first post, and second or third post), vacant 20th May, for duties with general Surgical Unit which includes some orthopædics. Posts are recognised for the Royal College of Surgeons. 6 months appointments.

Applications, stating age, qualifications, experience, and nationality, with the names of 2 referees, to the Acting Medical Director of the Hospital by 30th April, 1952.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER for Casualty duties, vacant now. Non-resident post. Recognised by Royal College of Surgeons for the final Fellowship examination. 12 months appointment. Hours 9 A.M.–5.30 P.M. Monday to Friday, 9 A.M.–1 P.M. Saturday.

Applications, stating age, qualifications, experience, and nationality, with the names of 2 referees, to the Secretary of the Management Committee, at Chase Farm Hospital by 7th May, 1952.

FALMOUTH HOSPITAL. West Cornwall Hospital MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON, vacant 10th July, 1952, in an extremely active general hospital doing major surgery and with both Outpatient and Casualty Departments.

Applications, stating age, nationality, qualifications, and experience, and accompanied by copies of 2 recent testimonials, should be forwarded to the Administrative Assistant, Falmouth Hospital, Falmouth.

GRIMSBY. SPRINGFIELD HOSPITAL. Sheffield REGIONAL HOSPITAL BOARD. Applications are invited for the resident whole-time post of REGISTRAR (chest diseases) to the above Hospital. The appointment is for 1 year in the first instance and may be renewed for a further year. Vacancy occurs 30th May.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10, to arrive not later than 5th May, 1952.

GRIMSBY GENERAL HOSPITAL. (220 Beds.) Grimsby HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER for Orthopædic, Fracture and Accident Service, now vacant. Previous surgical and orthopædic experience would be an advantage.

Applications should be sent immediately to the Administrative Officer, Grimsby General Hospital.

GRIMSBY GENERAL HOSPITAL. Grimsby Hospitals MANAGEMENT COMMITTEE. Locum HOUSE OFFICER (surgical) required immediately for a few weeks.

Apply Administrative Officer, Grimsby General Hospital.

GRIMSBY GENERAL HOSPITAL. (220 Beds.) Grimsby HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER (surgical), now vacant.

Apply to Administrative Officer, Grimsby General Hospital.

HERTFORD COUNTY HOSPITAL. (171 Beds—21 miles from London.) CASUALTY HOUSE OFFICER (Male or Female), first, second, or third post held, with attachment to Pædiatrician and Ophthalmic Consultant. Salary £350–£450 p.a., less £100 p.a. residential emoluments. Appointment to commence immediately.

Applications, with full details and references, to Secretary, County Hospital, Hertford, Herts.

HERTFORD COUNTY HOSPITAL. (171 Beds—Hospital situated 21 miles from London.) Applications are invited for appointment of HOUSE PHYSICIAN (Male or Female), second or third post held. R practitioners holding first post may apply. 6 months appointment. Preference given to applicants who have held resident surgical and medical posts in a general hospital. Salary at the rate of £400–£450 p.a., less £100 for residential emoluments. Duties to commence immediately.

Applications, to the Group Secretary, Hertford Group Hospital Management Committee, Hertford County Hospital, Hertford, Herts.

HALIFAX GENERAL HOSPITAL. (425 Beds.) Applications are invited for the post of HOUSE SURGEON (Male or Female), House Officer grade. Salary according to experience.

Applications, stating age, nationality, qualifications, and experience, with copy testimonials, to be addressed to the Secretary at the Royal Halifax Infirmary, Halifax.

HALIFAX. ST. JOHN'S (GERIATRIC) HOSPITAL. Applications are invited for the appointment of HOUSE PHYSICIAN (House Officer grade), Male or Female, at the above Hospital, accommodating 400 patients. This Hospital is provided with Consultant medical and ancillary services.

Applications, stating age, nationality, qualifications, and experience, together with copies of 3 testimonials, to be forwarded to the Secretary, Halifax Area Hospitals Management Committee, Royal Halifax Infirmary, Halifax.

HAREFIELD HOSPITAL, Harefield, Middlesex. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR required for 1 year in first instance in Thoracic Surgical Unit (100 Beds) at above Hospital.

Application forms obtainable from, and returnable to, Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex, by 6th May, 1952. Hospital may be visited by direct appointment.

HARROGATE AND DISTRICT GENERAL HOSPITAL. (253 Beds.) Applications are invited from registered medical practitioners for the post of HOUSE PHYSICIAN, vacant early April. Salary, according to experience, on the National Health Service scale.

Applications, as soon as possible, to the Assistant Secretary.

HASTINGS AND ST. LEONARDS. BUCHANAN HOS-PITAL. (94 Beds.) GYNÆCOLOGICAL HOUSE SURGEON required. Post is recognised for the M.R.C.O.G.—30 gynæcological beds—national scale of salary.

Apply to Hospital Administrator.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. Locum REGISTRAR in Pathology required 30th May, 1952, pending new appointment for Group Laboratory at above Hospital. National scale salary £775 p.a.

Applications, stating age, qualifications, and experience, with names of 2 referees, to the Group Secretary, 11, Holmesdale-gardens, Hastings.

HASTINGS. ST. HELEN'S HOSPITAL. (452 Beds.) HOUSE PHYSICIAN AND PÆDIATRIC HOUSE PHYSICIAN (combined post) required, Male or Female, post now vacant, resident. National scale of salary.

Apply to the Administrator at the Hospital.

HEMEL HEMPSTEAD. WEST HERTS HOSPITAL. (169 Beds—4 Residents.) CASUALTY OFFICER (Junior Hospital Medical Officer). Salary £700–£50–£1000 p.a., less £120 p.a. for residential emoluments.

Applications, giving full details, together with copies of 2 recent testimonials, should be sent to the Administrator.

HILLINGDON HOSPITAL, Uxbridge, Middlesex. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Part-time OPHTHALMIC REGISTRAR, 5 sessions per week. Appointment 1 year in first instance. This is a general hospital of 705 Beds, including ophthalmic beds, adults and children. Duties include work in Outpatient Department, wards, and operating theatre.

Application forms obtainable from, and returnable to, Secretary, Uxbridge Group Hospital Management Committee, Kingston-lane, Uxbridge, Middlesex, by 5th May. Candidates may visit Hospital by direct appointment with Medical Director.

HOVE GENERAL HOSPITAL. (75 Beds—3 Residents.) BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of HOUSE PHYSICIAN, vacant 9th May, 1952. Excellent clinical material available and the post is suitable for candidates working for a higher degree.

Applications, stating age, qualifications, &c., together with names and addresses of 2 referees, to be sent to the Administrative Officer, Hove General Hospital, Hove, 3, as soon as possible.

HOVE GENERAL HOSPITAL. (75 Beds—3 Residents.) BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the following resident posts, now vacant :—

SENIOR HOUSE SURGEON (preference will be given to candidates with previous experience). Duties chiefly ward and theatre work.

HOUSE SURGEON for casualty and with charge of surgical beds.

Salaries and conditions of service in accordance with national scale—£350–£450, less £100 p.a. for residential emoluments.

Applications, with full details of experience, &c., and enclosing names and addresses of 2 referees, should be sent to the Administrative Officer at the Hospital as soon as possible.

HULL. KINGSTON GENERAL HOSPITAL. (398 Beds —6 Residents.) HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE 2 HOUSE SURGEONS required immediately at the above Hospital. Duties : 1 mainly gynæcological and 1 general. Salary £350, £400, or £450 p.a. according to experience. The posts are resident and tenable for 6 months.

Applications, with full particulars to the Administrative Officer.

HULL ROYAL INFIRMARY. Hull A Group Hospital MANAGEMENT COMMITTEE. Locums required (Senior House Officer grade) for the following posts :—

RESIDENT SURGICAL OFFICER.
ORTHOPÆDIC HOUSE SURGEON.
HOUSE PHYSICIAN.

Applications to the Administrative Officer.

HUDDERSFIELD ROYAL INFIRMARY. (321 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required to commence duties immediately. Salary in accordance with terms and conditions of service for hospital medical and dental staffs, with full residential emoluments.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.
The Royal Infirmary, Huddersfield.

IPSWICH. BOROUGH GENERAL HOSPITAL, Heath-road, IPSWICH. (301 Beds.) HOUSE SURGEON required for General Surgeon, with casualty duties. Hospital recognised for the F.R.C.S. and D.A. examinations. Post in accordance with National Health Service regulations.

Applications to the Administrative Officer.

IPSWICH BOROUGH GENERAL HOSPITAL. (301 Beds —recognised for F.R.C.S. and D.A. examinations.) RESIDENT ANÆSTHETIST required immediately, Senior House Officer grade.

Applications to the Administrative Officer.

IPSWICH BOROUGH GENERAL HOSPITAL AND EAST SUFFOLK AND IPSWICH HOSPITAL. HOUSE SURGEON to Gynæcological and Obstetric Departments required early June. Post normally for 6 months (3 months at each hospital).

Applications to Secretary, Hospital Management Committee, Ipswich.

IPSWICH. EAST SUFFOLK AND IPSWICH HOS-PITAL. (350 Beds.) HOUSE SURGEON to Senior Consultant General Surgeon required 26th April. Post recognised for F.R.C.S.

Applications to the Secretary, Hospital Management Committee, Ipswich.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (350 Beds.) SENIOR HOUSE OFFICER (non-resident) to Radiological Department, post vacant late April. Candidates completing D.M.R. would be considered.

Applications to Secretary, Hospital Management Committee, Ipswich.

IPSWICH SANATORIUM. (100 Beds.) Senior House OFFICER required. This Sanatorium has been recently re-opened and entirely re-equipped for all modern forms of investigation of tuberculosis of the lungs and other diseases of the chest and for all treatment of pulmonary tuberculosis, including major surgery, which is about to be started. The Sanatorium is closely linked with the local chest service and clinic work is available, if the successful applicant so desires. Good living accommodation. Further inquiries may be addressed to the Physician-Superintendent.

Applications to— JOHN WILLIAMS, Secretary,
Hospital Management Committee, Ipswich.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. South WEST MIDDLESEX HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (resident post) to Department of Psychiatry. The Department includes a neurosis centre and observation wards.

Applications, stating age, nationality, qualifications, and experience, with copies of up to 3 recent testimonials, to Secretary of the Committee, West Middlesex Hospital, Isleworth, Middlesex, by 6th May, 1952.

KIDDERMINSTER AND DISTRICT GENERAL HOS-PITAL. KIDDERMINSTER, WORCS. 2 HOUSE SURGEONS. Resident posts, vacant now.

Applications, giving the names of 3 referees, to the Hospital Secretary.

KNOWLE, WARWICKSHIRE. MIDDLEFIELD HALL. (Male Mental defectives—270 Beds.) MONYHULL HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER (Male) required. House available in July.

Applications, stating age, qualifications, and experience, and details of 3 referees, to Medical Superintendent, Monyhull Hall, Birmingham, 14.

LANCASTER MOOR HOSPITAL, Lancaster. (Regional Mental Hospital—3000 Beds.) Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female). Preference given to candidates who have held house appointments at general hospitals. Modern methods of investigation and treatment carried out. Outpatient Clinics (3) staffed from the Hospital. Salary £700–£50–£1000 p.a., with appropriate deductions for residential amenities for single person or married couple. Post subject to National Health Service (Superannuation) Regulations, 1950, and the passing of a medical examination.

Applications, stating age, qualifications, and experience, with names of 2 referees, to be sent to the Medical Superintendent.

LIVERPOOL AND DISTRICT FAZAKERLEY GROUP OF HOSPITALS MANAGEMENT COMMITTEE. FAZAKERLEY HOSPITAL, Longmoor-lane, FAZAKERLEY, LIVERPOOL, 9. HOUSE OFFICER required at Fazakerley Hospital for vacancy end of May. The Hospital admits all types of infectious disease as well as many of palliative or general nature. Teaching centre for the University of Liverpool in infectious diseases. Salary according to national scale.

Applications, with names of 2 referees, to Physician-Superintendent, Fazakerley Hospital, Liverpool, 9.

LEICESTER GENERAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER (ortho-pædic) for Fracture and Orthopædic Service.

Applications, stating age, experience, and qualifications together with copies of recent testimonials, to the Secretary No. 1 Hospital Management Committee, 38A, East Bond-street Leicester.

LEICESTER ROYAL INFIRMARY. Sheffield Regional HOSPITAL BOARD. Applications are invited from registered medical practitioners for the non-resident whole-time post of REGISTRAR (pathology) to the above Hospital. The appointment is for 1 year in the first instance and may be renewed for a further year.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10, to arrive not later than 5th May, 1952.

LEAMINGTON SPA. WARNEFORD GENERAL HOS-PITAL. (207 Beds—General.) HOUSE SURGEON (first post), general surgery required. Salary £350 p.a., less £100 residential emoluments, in accordance with the terms and conditions of service for hospital medical staff.

Apply as soon as possible to—

Miss V. WELLS, Hospital Secretary.

LEAMINGTON SPA. WARNEFORD GENERAL HOS-PITAL. (207 Beds—General.) HOUSE SURGEON for Ophthalmic and E.N.T. Departments, tenure of post 6 months. Salary dependent on the number of posts previously held and in accordance with the terms and conditions of service for hospital medical staff.

Apply as soon as possible to the Hospital Secretary.

LEAMINGTON SPA. WARNEFORD GENERAL HOS-PITAL. (207 Beds.) SOUTH WARWICKSHIRE HOSPITAL GROUP (NO. 14). Applications are invited for the appointment of RESIDENT ANÆSTHETIST. R practitioners holding first posts may apply. 6 months appointment, commencing immediately. The post is recognised for the D.A. Salary £300 or £350, according to previous number of appointments held, plus full residential emoluments.

Applications as soon as possible to—

Miss V. WELLS, Hospital Secretary.

Warneford General Hospital.

LEEDS, 9. ST. JAMES'S HOSPITAL. Leeds A Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER (orthopædic surgery) at the above Hospital. The appointment will be for a period of 1 year and the salary will be in accordance with the agreed terms and conditions of service of hospital medical and dental staffs—namely, £670 p.a with an appropriate deduction in respect of board, lodging, and other services provided.

Applications, stating age, qualifications, experience, &c., together with the names of 3 persons to whom reference may be made, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.

Administrative Offices, St. James's Hospital, Leeds, 9.

LEEDS A GROUP HOSPITAL MANAGEMENT COM-MITTEE. Applications are invited from registered medical practitioners (Male and Female) for the following House Officer appointments, tenable 1st May, 1952, for a period of 6 months :—

St. James's Hospital

*1 HOUSE SURGEON (general surgery).
1 HOUSE SURGEON (orthopædics).
1 HOUSE SURGEON (E.N.T. and ophthalmology).

St. Mary's Hospital

†1 HOUSE SURGEON (obstetrics).

*Recognised by the Royal College of Surgeons for Fellowship.
†Recognised by the Royal College of Obstetricians and Gynæcologists for Diploma.

The appointments are subject to the terms and conditions of service as issued by the Ministry of Health, with salary according to number of posts previously held.

Applications, stating age, qualifications, and experience, together with copies of 3 recent testimonials, should be forwarded to the Administrative Medical Officer, St. James's Hospital, Leeds, 9, as soon as possible.

J. FOLKARD, Secretary to the Committee.

LEEDS, 2. PUBLIC DISPENSARY AND HOSPITAL. LEEDS A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of CASUALTY OFFICER (Senior House Officer) at the above Hospital. The appointment will be for a period of 1 year and the salary will be in accordance with the agreed terms and conditions of service of hospital medical and dental staffs—namely, £670 p.a. with an appropriate deduction in respect of board, lodging, and other services provided.

Applications, stating age, qualifications, experience, &c., together with the names of 3 persons to whom reference may be made, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.

Administrative Offices, St. James's Hospital, Leeds, 9.

LEEDS REGIONAL HOSPITAL BOARD invites applica-tions for the appointment of a REGISTRAR in Orthopædic Surgery (non-resident), for duties mainly at the Halifax Royal Infirmary and at other hospitals in the Halifax Hospital Management Committee Group.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 9th May, 1952.

LEEDS REGIONAL HOSPITAL BOARD invites applica-tions for the appointment of REGISTRAR in Orthopædic Surgery to the regional rheumatism scheme, for duties mainly at the Royal Bath Hospital, Harrogate. The appointment will be resident for which the appropriate deduction from salary will be made.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 9th May, 1952.

LEEDS REGIONAL HOSPITAL BOARD invites applica-tions for the post of REGISTRAR in Radiology (non-resident) for duties at hospitals within the Hull A, Hull B, and East Riding Hospital Management Committee Groups.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Park-parade, Harrogate, not later than 9th May, 1952.

LLANDUDNO GENERAL HOSPITAL, Llandudno. Appli-cations are invited for the appointment of SENIOR HOUSE SURGEON (resident) at the above Hospital. Salary £670 p.a. The appointment is for a period of 6 months.

Applications, stating age, experience, and qualifications, together with names and addresses of 2 referees, should be forwarded within 10 days of the appearance of this advertisement to the Secretary, Caernarvon and Anglesey Hospital Management Committee, Plas Gwyn, Ffriddoedd-road, Bangor, N. Wales.

LOUGHBOROUGH GENERAL HOSPITAL. (120 Beds.) Applications are invited for the vacancy of HOUSE SURGEON, commencing immediately.

Applications stating age, qualifications, and experience, together with copies of recent testimonials, to the Secretary, Leicester No. 1 Hospital Management Committee, 38A, East Bond-street, Leicester.

LOUGHBOROUGH GENERAL HOSPITAL. (120 Beds.) Applications are invited for the post of HOUSE PHYSICIAN, commencing immediately.

Applications, stating age, experience, and qualifications, with copies of recent testimonials, to the Secretary, No. 1 Hospital Management Committee, 38A, East Bond-street, Leicester.

LUTON AND DUNSTABLE HOSPITAL, Luton, Beds. Applications are invited for the post of SENIOR HOUSE OFFICER to Pathological Department, vacant 1st June, 1952. The Laboratory is modern and well equipped and serves a large area.

Applications, stating age, nationality, and qualifications, and giving the names and addresses of 3 referees, should be sent to the Secretary not later than 14 days after the publication of this advertisement.

MINSTER, SHEPPEY, KENT. SHEPPEY GENERAL HOSPITAL. MEDWAY AND GRAVESEND HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON (Senior House Officer grade). Applications are invited from registered medical practitioners with previous hospital experience for above post (Senior of 3), vacant 12th May. Appointment will be for 12 months at a salary of £670 p.a. and is suitable for candidate seeking further clinical experience and opportunity for reading for higher qualification.

Applications, stating age, qualifications, nationality, and experience, to be addressed to the Secretary, Medway and Gravesend Hospital Management Committee, St. William's Hospital, Rochester.

MAIDSTONE (near). LENHAM SANATORIUM. (172 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER at Lenham Sanatorium, near Maidstone. The Sanatorium has 172 Beds for the treatment of pulmonary tuberculosis. Post vacant 1st June, 1952. Salary £670 a year, with a deduction of £150 a year for residential emoluments. Appointment for 12 months.

Applications to Physician-Superintendent, Lenham Sanatorium, near Maidstone.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (135 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of either :—

RECEIVING ROOM OFFICER. Salary £670 a year, with deduction of £150 a year for residential emoluments. Appointment for 12 months. Post now vacant, or

CASUALTY OFFICER. Salary at the rate of £350, £400, or £450 a year, according to experience. A deduction of £100 a year for residential emoluments. Post now vacant.

Applications immediately to the Administrative Officer, West Kent General Hospital, Marsham-street, Maidstone.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in General Medicine (wholly or partly resident) to the North Manchester Group of Hospitals, with main duties at Crumpsall Hospital, Manchester. Senior medical students of the University of Manchester are officially attached to the Medical Unit of this Hospital for clinical teaching.

Forms of application may be obtained from the Senior Administrative Medical Officer, Manchester Regional Hospital Board, Cheetwood-road, Manchester, 8, and should be returned, with copies of 2 recent testimonials, to be received by 5th May, 1952.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of RESIDENT REGISTRAR in Anæsthetics at Crumpsall Hospital, Manchester. The Hospital is recognised for the purpose of the D.A.

Forms of application may be obtained from the Senior Administrative Medical Officer, Manchester Regional Hospital Board, Cheetwood-road, Manchester, 8, and should be returned, with copies of 2 recent testimonials, to be received by 5th May, 1952.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for 2 posts of RESIDENT REGISTRAR in Psychiatry. The persons appointed will spend 18 months at Prestwich Mental Hospital, near Manchester, and 6 months at Calderstones Mental Deficiency Hospital, Whalley, near Blackburn. Facilities will be granted to take the D.P.M. course at Manchester University.

Forms of application may be obtained from the Senior Administrative Medical Officer, Manchester Regional Hospital Board, Cheetwood-road, Manchester, 8, and should be returned, with copies of 2 recent testimonials, to be received by 5th May, 1952.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for 2 posts of NON-RESIDENT REGISTRAR in Clinical Pathology as follows :—

(*a*) Preston and Chorley Group of Hospitals, with main duties at Preston Royal Infirmary.

(*b*) North Manchester Group of Hospitals, with main duties at Crumpsall Hospital, Manchester.

Forms of application may be obtained from the Senior Administrative Medical Officer, Manchester Regional Hospital Board, Cheetwood-road, Manchester, 8, and should be returned, with copies of 2 recent testimonials, to be received by 5th May, 1952.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of RESIDENT SURGICAL OFFICER (Registrar) at Manchester Northern Hospital.

Forms of application may be obtained from the Senior Administrative Medical Officer, Manchester Regional Hospital Board, Cheetwood-road, Manchester, 8, and should be returned, with copies of 2 recent testimonials, to be received by 5th May, 1952.

MANCHESTER, 19. THE DUCHESS OF YORK HOSPITAL FOR BABIES. MANCHESTER BABIES' AND CHILDREN'S HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE PHYSICIAN (first, second, or third post), Male or Female, for 6 months from 28th April, 1952. Salary in accordance with Ministry of Health scale.

Applications, with copies of 3 testimonials, to be sent to the Administrative Officer of the Hospital immediately.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Required, HOUSE SURGEON (first or subsequent post). Salary £350–£450 p.a., according to the number of positions previously held, less £100 p.a. for residential emoluments. Appointment of a practitioner within 3 months of qualification and subject to National Service Acts would be limited to 6 months.

Application forms available on application to—

H. R. NORTH, General Superintendent.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the following posts :—

Park Hospital, Davyhulme (General Hospital—426 Beds)

SENIOR HOUSE OFFICER (pædiatrics), the post is now vacant.

HOUSE OFFICER (non-tuberculous thoracic surgery) for Manchester Regional Hospital Board Centre, vacant mid-May, 1952.

The Pædiatric Unit comprises 36 Beds and Cots, including 10 non-tuberculous thoracic surgery beds. The hospital has a Neonatal Department of 73 obstetric beds. Vacancies occur periodically in the various departments at Park Hospital, and House Officers are eligible for appointment to another specialty at the end of the original term of service when such vacancies occur.

Eccles and Patricroft Hospital (General Hospital—72 Beds)

SENIOR HOUSE OFFICER, now vacant.

HOUSE OFFICER, now vacant.

The work of the Hospital is mainly surgical and there is a busy Outpatient Department.

Salaries for House Officer posts £350–£450 p.a., according to experience, £100 p.a. deduction for residential accommodation and services, 6 months appointment. The Senior House Officer appointments will be for 12 months at a salary of £670 p.a. less £130 p.a. (Eccles and Patricroft Hospital); £155 p.a (Park Hospital), for residential accommodation and services.

Application forms from the Secretary, Park Hospital, Davyhulme, Manchester.

MANSFIELD AND DISTRICT GENERAL HOSPITAL. Locum SURGICAL REGISTRAR required at the above Hospital for 2 months commencing 1st May, 1952. Salary at the rate of £775 p.a. Accommodation is available.

Apply to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10.

MEXBOROUGH. MONTAGU HOSPITAL. Sheffield REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the resident post of Whole-time REGISTRAR (anæsthetics) to the above Hospital. The appointment is for 1 year in the first instance, and may be renewed for a second year.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10, to reach him not later than 5th May, 1952.

NORWICH. NORFOLK AND NORWICH HOSPITAL. (440 Beds.)

HOUSE SURGEON (Male or Female), vacant 3rd June, resident. Recognised for final F.R.C.S. Duties entirely general surgical.

HOUSE PHYSICIAN (Male or Female), vacant 4th June, resident.

Salary in each case £350–£450, according to experience.

Applications, stating age, qualifications, experience, naming 2 referees, to the Secretary, Norwich, Lowestoft and Great Yarmouth Hospital Management Committee, St. Stephen's-road, Norwich.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the post of ORTHOPÆDIC AND FRACTURE SENIOR HOUSE OFFICER. The post offers exceptional experience in traumatic surgery. Duties to commence as soon as possible. Salary £670 p.a., less £150 residential emoluments.

Applications, with copies of testimonials, should be sent as soon as possible to HENRY M. STANLEY, Secretary.

NOTTINGHAM GENERAL HOSPITAL. Required, SENIOR SURGICAL HOUSE OFFICER for the above Hospital. Duties to commence about 25th June. Salary £670 p.a. If resident £150 deducted for emoluments. Conditions of service in accordance with the published conditions of the Ministry of Health.

Applications, stating age, qualifications, and experience, together with copies of testimonials, to be sent to—

HENRY M. STANLEY, Secretary.

NOTTINGHAM GENERAL HOSPITAL. Required, HOUSE SURGEON (resident), Male or Female, for the above Hospital, duties to commence as soon as possible. Salary and conditions of service in accordance with published regulations of the Ministry of Health. If held by a R practitioner the appointment will be for a period of 6 months.

Applications, stating age, qualifications, and experience, together with copies of testimonials, to be sent to—

HENRY M. STANLEY, Secretary,
Nottingham No. 1 Hospital Management Committee.

NOTTINGHAM. CITY HOSPITAL. (833 Beds.) Applications are invited for the post of RESIDENT PATHOLOGIST (Senior House Officer). Previous experience an advantage. Salary at the rate of £670 p.a., less £130 p.a. for residential emoluments. The post becomes vacant on 2nd May, 1952, and is tenable for 12 months.

Applications, stating age, nationality, qualifications, and experience, together with copies of not more than 3 testimonials, to be sent to the Administrative Officer, City Hospital, Hucknall-road, Nottingham.

NORTHAMPTON GENERAL HOSPITAL. (487 Beds.) NORTHAMPTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for 3 posts of HOUSE SURGEONS, vacant now. Recognised for the F.R.C.S. Ministry of Health salary scale and conditions of service for House Officers. 6 months appointments.

Applications, giving particulars and enclosing copies of 3 recent testimonials, should be sent as soon as possible, addressed to S. G. HILL, Superintendent.

NEWCASTLE GENERAL HOSPITAL. Newcastle upon TYNE HOSPITAL MANAGEMENT COMMITTEE. GERIATRIC UNIT. (300 Beds.) Applications are invited from registered medical practitioners (Male and Female), within 3 months of qualification, for the resident post of HOUSE PHYSICIAN which becomes vacant on 1st May, 1952. The Unit is in the charge of a Consultant Physician. It includes wards in Newcastle General Hospital and long-stay annexes, 1 of which is the St. Mary Magdalene Home, having 110 Beds for chronic medical conditions, chiefly neurological. The post offers extensive clinical experience in the diagnosis and treatment of acute and chronic disease. The appointment is tenable for 6 months. Salary according to terms and conditions of service of hospital medical and dental staffs (England and Wales).

Applications, together with 1 copy of 2 testimonials should be sent as soon as possible to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4.

NEWCASTLE REGIONAL HOSPITAL BOARD. Durham HOSPITAL MANAGEMENT COMMITTEE GROUP. Whole-time REGISTRAR (General) for Orthopædic Surgery required up to 30th September, 1952, in the first instance. Salary £775.

Applications, together with names and addresses of 1–3 referees and/or 1–3 testimonials, to be addressed to the Senior Administrative Medical Officer, " Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Holywood HALL SANATORIUM, WOLSINGHAM. (180 Beds.) REGISTRAR CHEST PHYSICIAN (resident), whole-time, required up to 31st August, 1953, in the first instance. Salary scale £775–£890.

Applications, with names and addresses of 1–3 referees and/or 1–3 testimonials, to be addressed to the Senior Administrative Medical Officer, " Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 14 days.

NEWCASTLE UPON TYNE, 3. W. J. SANDERSON ORTHOPÆDIC HOSPITAL, GOSFORTH. (121 Beds.) NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required. Appointment is full-time and is resident (married quarters available). Preference given to those holding, or studying for, a higher qualification. The Hospital is for the treatment of orthopædic and surgical tuberculosis conditions in children up to the age of 16. Outpatient Clinics are held in the County of Northumberland and the City of Newcastle, and the Senior House Officer may be required to conduct some of these.

Applications, with names and addresses of 2 referees, should be sent to the Secretary, Newcastle upon Tyne Hospital Management Committee, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4.

PENZANCE. WEST CORNWALL HOSPITAL. (General Hospital—100 Beds.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE SURGEON (Male or Female), post now vacant. National salary and conditions of service.

Applications, stating age, nationality, qualifications, and experience, together with copies of 2 recent testimonials, should be forwarded to the Administrative Assistant, West Cornwall Hospital, Penzance.

PENZANCE. WEST CORNWALL HOSPITAL. (General Hospital—100 Beds.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of HOUSE PHYSICIAN (Male) which falls vacant on 1st July, 1952. Salary at the rate of £350 or £400 p.a., from which a deduction at the rate of £100 p.a. will be made for board-residence, &c.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of 3 recent testimonials, should be forwarded to the Administrative Assistant, West Cornwall Hospital, Penzance.

NEWARK HOSPITAL, London-road, Newark, Notts. (81 Beds.) NOTTINGHAM NO. 1 HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (first or subsequent post) for the care of both medical and surgical cases. Appointment for 6 months. Duties to commence immediately.

Applications, stating age, qualifications, &c., and enclosing copies of recent testimonials, should be sent to the Assistant Secretary, Newark Hospital, London-road, Newark, Notts.

NEWMARKET GENERAL HOSPITAL, Newmarket, SUFFOLK. Applications are invited for the post of HOUSE SURGEON, vacant 30th April, 1952. Duties include care of general surgical, E.N.T. and ophthalmic patients. The post is resident and available for 6 months. Salary in accordance with national scale.

Applications, with copies of 3 recent testimonials, should be addressed to the Physician-Superintendent.

ORPINGTON HOSPITAL, Orpington, Kent. (983 Beds.) ORPINGTON AND SEVENOAKS HOSPITAL MANAGEMENT COMMITTEE. RESIDENT ANÆSTHETIST (Male), Senior House Officer. The post which becomes vacant on 1st June, 1952, is recognised for the D.A. Appointment for 6 months with 6 months extension if satisfactory.

Applications, stating age, qualifications, experience, and names and addresses of 2 referees, to be sent to the Physician-Superintendent by 30th April, 1952.

OXFORD REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of REGISTRAR in General Medicine to the Northampton General and associated Hospitals. The post will be held for 1 year and be eligible for extension to a second year. Single accommodation available.

Applications, on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 9th May, 1952.

OXFORD REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of SENIOR REGISTRAR in Anæsthetics (non-resident) to the Aylesbury Group of Hospitals as a member of the area team. The post will be held for 1 year and be eligible for extension to the normal tenure. Candidates should hold the D.A.

Applications, on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 9th May, 1952.

OXFORD REGIONAL HOSPITAL BOARD. Applications are invited for the non-resident post of REGISTRAR in Obstetrics and Gynæcology in the High Wycombe/Amersham Area. The appointment will be for 1 year in the first instance and be eligible for extension for a second year.

Applications on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 10th May.

OXFORD REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of REGISTRAR in Orthopædic and Accident Surgery to the hospitals of the Swindon Area and the associated clinics of the Wingfield-Morris Orthopædic Hospital. Single accommodation is available. The appointment will be for 1 year in the first instance and be eligible for extension to a second year.

Applications on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 10th May.

OXFORD. THE UNITED OXFORD HOSPITALS. Applications are invited for the immediate vacancy of HOUSE SURGEON to the Accident Service at the Radcliffe Infirmary for 6 months.

Apply, stating age, qualifications, and experience, with names of 2 referees, to the Administrator, Radcliffe Infirmary, Oxford.

PAISLEY AND DISTRICT HOSPITALS BOARD OF MANAGEMENT. INFECTIOUS DISEASES HOSPITAL, PAISLEY. THORACIC SURGERY UNIT. Applications are invited from suitably qualified medical practitioners for the post of JUNIOR HOSPITAL MEDICAL OFFICER for duty at the above Unit. Applicants should be at least 2 years qualified.

Replies should be addressed to the Group Medical Superintendent, Royal Alexandra Infirmary, Paisley, and should be submitted within 1 week of publication of this advertisement.

PLYMOUTH SPECIAL HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER, Isolation Hospital, Plymouth. Applications are invited for the above appointment from unmarried Male registered medical practitioners who have been qualified for 1 year and who have had a minimum of 1 year's hospital experience. The applicant should preferably be able to drive a car. The duties in 2 departments will be chiefly in connection with infectious and venereal diseases, the former including a substantial proportion of cases in children. The varied clinical work, including acute medical cases and early pulmonary tuberculosis, provides valuable experience, particularly to those reading for a higher medical degree. The post is resident and the appointment will be for 1 year from 5th June.

Applications, together with copies of 3 recent testimonials, should be sent to the Group Secretary, Plymouth Special Hospital Management Committee, 8, Nelson-gardens, Stoke, Plymouth, by 5th May, 1952.

PLYMOUTH, SOUTH DEVON AND EAST CORNWALL GENERAL HOSPITAL GROUP. Applications invited from duly qualified and registered medical practitioners for the appointment of RESIDENT SENIOR HOUSE OFFICER in Pathology, vacant immediately. The appointment will be for a period of 12 months. A new area laboratory at the South Devon and East Cornwall Hospital, Greenbank-road, Plymouth, which will provide excellent modern working facilities, is now completed and will be opened almost immediately.

Applications, stating age, nationality, qualifications, and experience, together with the names and addresses of 3 referees, to be sent to the undersigned, as soon as possible.

7, Nelson-gardens, Stoke, Plymouth. ARTHUR R. CASH.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE, near PONTYPRIDD. (316 Beds—Committee's base hospital serving population of 177,000 and recognised for the D.C.H.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the posts of 2 HOUSE OFFICERS (first or second posts), pædiatrics.

Applications, stating age, qualifications, and experience, together with copies of 2 recent testimonials, to be sent as soon as possible, to the Group Secretary, Courthouse-street, Pontypridd.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE, near PONTYPRIDD. (316 Beds—Committee's base hospital serving population of 177,000.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER (first or second post), surgical.

Applications, stating age, qualifications, and experience, together with copies of 2 recent testimonials, to be sent as soon as possible to the Secretary of the Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

PRESTON ROYAL INFIRMARY. (400 acute beds.) Applications are invited for the following posts :—

RESIDENT SENIOR HOUSE OFFICER (pathological).

HOUSE OFFICERS for special departments—viz., Casualty, Orthopædics, Ophthalmic, Urological.

Please apply to Secretary, Preston and Chorley Hospital Management Committee, Royal Infirmary, Preston.

H. HILL, Secretary.

REDRUTH. CAMBORNE-REDRUTH HOSPITAL. West CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male or Female) for the appointment of FIRST HOUSE SURGEON to the Obstetric and Gynæcological Departments, now vacant.

Applications, stating age, experience, qualifications, and nationality, together with copies of 3 testimonials, should be submitted to the undersigned immediately.

N. O. DEANS, Administrative Assistant.

Camborne-Redruth Hospital, Redruth.

REDRUTH. CAMBORNE-REDRUTH GENERAL HOSPITAL. (159 Beds—4 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of HOUSE PHYSICIAN (Male or Female), vacant 1st June, 1952. R practitioners within 3 months of qualification may apply.

Applications, stating age, nationality, qualifications, and experience, together with copies of 2 testimonials, should be forwarded to the Administrative Assistant, Camborne-Redruth General Hospital, Redruth.

REDRUTH. CAMBORNE-REDRUTH HOSPITAL. West CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male or Female) for the appointment of SECOND HOUSE SURGEON to the Obstetric and Gynæcological Departments, vacant 14th May.

Applications, stating age, experience, qualifications, and nationality, together with copies of 3 testimonials, should be submitted to the undersigned immediately.

N. O. DEANS, Administrative Assistant.

Camborne-Redruth Hospital, Redruth.

ROCHFORD, ESSEX. GENERAL HOSPITAL. (603 Beds.) SOUTHEND-ON-SEA HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of RESIDENT HOUSE SURGEON (recognised for F.R.C.S.), which is now vacant, and is of 6 months duration. The duties are predominantly in general surgery, but the successful applicant will also be responsible to the Consultant Orthopædic Surgeon for all orthopædic and fracture cases. Salary according to previous appointments held.

Applications, with copies of at least 2 recent testimonials, should be sent to the undersigned at the General Hospital, Rochford, Essex, not later than 10th May, 1952.

J. C. FIELD, Secretary.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (718 Beds.) Applications are invited from registered medical practitioners for the post of ORTHOPÆDIC HOUSE SURGEON (resident), in the Orthopædic and Accident Unit. The service consists of 100 Beds equally divided between traumatic surgery and "cold" orthopædics. 6 months post.

Applications, stating age, nationality, qualifications with dates, present appointment, and experience, and 2 recent testimonials or names of 2 referees, should be forwarded immediately to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROTHERHAM CLINICAL LABORATORY, Moorgate GENERAL HOSPITAL, ROTHERHAM. SHEFFIELD REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the non-resident whole-time post of REGISTRAR (pathology) to the above Laboratory, with duties at associated clinical laboratories within the area of the Rotherham and Mexborough Hospital Management Committee. The appointment is for 1 year in the first instance and may be renewed for a further year.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10, to arrive not later than 5th May, 1952.

RHONDDA. PORTH AND DISTRICT HOSPITAL. (110 Beds. This Hospital is visited regularly by Consultants from the Cardiff Royal Infirmary.) Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (surgical).

Applications, stating age, qualifications, experience, together with copies of 2 recent testimonials, to be sent as soon as possible to the Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

RHONDDA. PORTH AND DISTRICT HOSPITAL. (110 Beds.) (This Hospital is visited regularly by Consultants from the Cardiff Royal Infirmary.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER (first or second post), surgical and casualty.

Applications, stating age, qualifications, and experience, together with copies of 2 recent testimonials, to be sent as soon as possible to the Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

RENFREWSHIRE MENTAL HOSPITALS BOARD. Applications are invited for a whole-time appointment as SENIOR HOUSE OFFICER (medical) at Ravenscraig (Mental and General) Hospital, Greenock. The appointment will be for 1 year in the first instance and will be subject to the National Health Service (Scotland) superannuation regulations. The salary is £670 p.a.

Applications, stating age, qualifications, and present employment, and giving names of 3 referees, should be submitted, in writing, at once to the Physician-Superintendent of the Hospital.

READING. ROYAL BERKSHIRE HOSPITAL (403 Beds) and BATTLE HOSPITAL (420 Beds). Applications invited from registered medical practitioners (Male) for post of RESIDENT HOUSE SURGEON to the Area Accident and Orthopædic Department, vacant immediately. Also casualty duties.

Apply, stating age, qualifications with dates, nationality, present post, with copies of 3 recent testimonials, to Administrative Officer, Royal Berkshire Hospital, Reading.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for a post of SENIOR HOUSE OFFICER in Anæsthetics (non-resident) with duties mainly at the Inverness Hospitals.

Forms of application and further particulars are obtainable from the undersigned, with whom applications should be lodged by 12th May, 1952. A. M. FRASER, M.D.,

Secretary and Administrative Medical Officer.

Office of the Northern Regional Hospital Board, Raigmore, Inverness.

SCUNTHORPE AND DISTRICT WAR MEMORIAL HOSPITAL. SHEFFIELD REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the non-resident whole-time post of REGISTRAR (anæsthetics) to the above Hospital, which is recognised for training for the D.A. The appointment is for 1 year in the first instance and may be renewed for a further year.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10, to arrive not later than 12th May, 1952.

SCUNTHORPE AND DISTRICT WAR MEMORIAL HOSPITAL. SHEFFIELD REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the resident whole-time post of SURGICAL REGISTRAR to the above Hospital, which is recognised for training for the F.R.C.S. The appointment is for 1 year in the first instance and may be renewed for a further year.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10, to arrive not later than 12th May, 1952.

SHEFFIELD. CITY GENERAL HOSPITAL. Applications are invited from suitably qualified medical practitioners for the resident post of SENIOR HOUSE OFFICER to the Thoracic Surgery Unit. Preference will be given to candidates with experience in chest diseases and holding a higher surgical qualification.

Apply, giving full details of age, qualifications, present and previous appointments with dates, and the names of 2 persons to whom reference may be made, to the undersigned at Nether Edge Hospital, Sheffield, 11.

W. STANSFIELD, Group Secretary.

SHEFFIELD. CITY GENERAL HOSPITAL. (Recognised for F.R.C.S. England.) Applications are invited for the resident post of SENIOR HOUSE OFFICER (Male or Female) in the Casualty Department. Facilities also for experience in Orthopædic Department if desired.

Applications, giving full details of age, nationality, qualifications, present and previous appointments with dates, and the names of 2 persons to whom reference may be made, should be forwarded to the undersigned at Nether Edge Hospital, Sheffield, 11. W. STANSFIELD, Secretary.

SHEFFIELD. CITY GENERAL HOSPITAL. Applications are invited from suitably qualified practitioners for the resident appointment of SENIOR HOUSE OFFICER in Pathology for the Area Pathology Laboratory, City General Hospital and Associated Laboratories.

Applications, giving full details of age, nationality, qualifications, present and previous appointments with dates, and the names of 2 persons to whom reference may be made, should be forwarded to the undersigned at Nether Edge Hospital, Sheffield, 11. W. STANSFIELD, Group Secretary.

SHEFFIELD. KING EDWARD VII ORTHOPÆDIC HOSPITAL, Rivelin Valley-road, SHEFFIELD, 6. (140 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. SHEFFIELD NO. 3 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of RESIDENT SENIOR HOUSE OFFICER at the above Hospital. Candidates should have held a resident appointment in a hospital. Salary £670 p.a., subject to a deduction of £165 p.a. for full residential emoluments. The appointment is normally for 1 year, subject to 1 month's notice either side.

Applications, stating age, qualifications, experience, &c., to be forwarded to the Secretary, Sheffield No. 3 Hospital Management Committee, Lodge Moor Hospital, Sheffield, 10.

SHEFFIELD NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from suitably qualified practitioners for the resident post of SENIOR HOUSE OFFICER (psychiatry) for duties at the City General Hospital and the adjoining Fir Vale Infirmary, recognised for the D.P.M. examination. Applicants should, preferably, have held general hospital posts but psychiatric experience is not essential. The successful candidate will form part of a team consisting of a consultant psychiatrist and an assistant psychiatrist within the setting of a large modern general hospital. The duties will form an introduction to the investigation and treatment of the psychoneuroses, psychosomatic disorders, and acute psychoses.

Apply, giving full details of age, qualifications, present and previous appointments with dates, and the names of 2 persons to whom reference may be made, to the undersigned at Nether Edge Hospital, Sheffield, 11.

W. STANSFIELD, Group Secretary.

SHEFFIELD REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the post of REGISTRAR (chest diseases), South Lincolnshire Area. The successful candidate would reside at the Lincoln Isolation Hospital and also attend associated Chest Clinics under the supervision of the Consultant Chest Physician. The appointment is for 1 year in the first instance and may be renewed for a further year.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, to arrive not later than 12th May, 1952.

SHREWSBURY. EYE, EAR AND THROAT HOSPITAL. (70 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (E.N.T.) at the Eye, Ear and Throat Hospital, Shrewsbury, vacant 1st May, 1952. Post recognised for the D.L.O. R.C.S.

Applications, stating age, qualifications, nationality, and experience, together with copies of recent testimonials, should be sent to— J. P. MALLETT, Secretary,

Shrewsbury Group 15 Hospital Management Committee.

Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY AND COPTHORNE HOSPITAL. (500 Beds.) Applications are invited for the post of RESIDENT ANÆSTHETIST (House Officer grade), vacant now. Post recognised for the D.A.

Applications, stating age, nationality, qualifications, and previous hospital appointments, together with copies of recent testimonials, should be sent to the Secretary, Group 15 Hospital Management Committee, Royal Salop Infirmary, Shrewsbury. J. P. MALLETT, Secretary,

Shrewsbury Group Hospital Management Committee.

SHREWSBURY. ROYAL SALOP INFIRMARY AND COPTHORNE HOSPITAL. (500 Beds.) SHREWSBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of GYNÆCOLOGICAL HOUSE SURGEON (Male or Female), vacant immediately. There are 50 gynæcological beds and 2 House Surgeons. The post is recognised for the M.R.C.O.G.

Applications, stating age, qualifications, nationality, and experience, accompanied by copy testimonials, should be sent to the Secretary, Group 15 Hospital Management Committee, Royal Salop Infirmary, Shrewsbury.

J. P. MALLETT, Group Secretary.

Royal Salop Infirmary, Shrewsbury, 10th April, 1952.

SHREWSBURY. ROYAL SALOP INFIRMARY. (241 Beds.) Applications are invited from registered medical practitioners for the appointment of ORTHOPÆDIC/ACCIDENT HOUSE SURGEON (Senior House Officer), vacant 1st May, 1952. The successful applicant will be allowed to attend for 2 days a month at The Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry, for postgraduate study, with the Consultant.

Applications, stating age, qualifications, nationality, and experience, accompanied by copy testimonials, should be sent to the Secretary, Group 15 Hospital Management Committee, Royal Salop Infirmary, Shrewsbury.

J. P. MALLETT, Secretary,

Shrewsbury Group Hospital Management Committee.

SHREWSBURY. ROYAL SALOP INFIRMARY. (241 Beds.) Applications are invited from registered medical practitioners (Male or Female) for the appointment of RESIDENT HOUSE SURGEON (second or third post) to a General Consulting Surgeon, vacant immediately. The successful applicant will be responsible for 40 surgical beds, and the post is recognised for the F.R.C.S.

Applications, stating age, qualifications, nationality, and experience, accompanied by copy testimonials, should be sent to the Secretary, Group 15 Hospital Management Committee, Royal Salop Infirmary, Shrewsbury.

J. P. MALLETT, Secretary,

Shrewsbury Group Hospital Management Committee.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT HOUSE SURGEON to the Gynæcological Department, for a period of 6 months from 8th June, 1952.

Applications, naming 2 referees, to Group Secretary, Odstock Hospital, Salisbury.

SOUTHAMPTON CHILDREN'S HOSPITAL. (Recognised by Conjoint Board for D.C.H.) HOUSE OFFICER required, post vacant 6th June, 1952. Salary, &c., as nationally advocated. Preference given to candidates intending to specialise in pædiatrics.

Applications, with copies of testimonials, to be submitted not later than 10th May, to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL (280 Beds) and SOUTHAMPTON GENERAL HOSPITAL (453 Beds). Applications are invited for the whole-time post of SENIOR HOUSE OFFICER (E.N.T.), now vacant. The post is recognised for the F.R.C.S. (Eng.) and D.L.O. examinations, providing experience in all branches of E.N.T. work, including audiometry. The group includes a diagnostic and distributing Hearing-aid Centre. Occasional work at other hospitals may be required.

Applications, with copies of 3 recent testimonials, should be forwarded as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (280 Beds.) SENIOR HOUSE OFFICER (orthopædic), Casualty Officer, required immediately for the above Hospital (Orthopædic Unit 74 Beds). This Hospital is the centre to which all trauma from a large industrial town and port is directed, thus providing excellent experience in the treatment of traumatic conditions.

Applications, with copies of testimonials, to be submitted as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (280 Beds.) SENIOR HOUSE OFFICER, Casualty Officer/House Surgeon, required immediately.

Applications, with copies of testimonials, to be submitted as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTH EAST ESSEX HOSPITAL MANAGEMENT COMMITTEE. Locum required. SENIOR ANÆSTHETIC REGISTRAR, Orsett Hospital, immediately to 7th May, 1952. Salary £1100 p.a., less £130 emoluments.

Applications should be forwarded to the Secretary, South East Essex Hospital Management Committee, Thurrock Hospital, Grays, Essex.

SOUTHERN AYRSHIRE HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the post of HOUSE PHYSICIAN at Heathfield Hospital, Ayr. Appointment will involve duty principally in the Tuberculosis Unit (54 Beds), but will also include duty in the Infectious Diseases Unit (30 Beds) and Pædiatric Unit (14 Beds). Tenure of post 6 months, commencing 30th April, 1952. Salary £350–£450 in accordance with experience, less deduction of £100 p.a. for residential emoluments.

Applications to the Area Medical Superintendent, Ballochmyle Hospital, Mauchline, within 14 days of the appearance of this advertisement.

SOUTHEND. GENERAL HOSPITAL. House Surgeon (House Officer grade) required for duties in Ophthalmic Department with relief duties in E.N.T. Department. Salary according to previous appointments held, less deductions for board.

Applications, with details of qualifications, &c., and copies of recent testimonials, to reach the undersigned as soon as possible.

J. C. FIELD, Secretary,
Southend-on-Sea Hospital Management Committee.

SIDCUP. QUEEN MARY'S HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER in the Orthopædic Department. Salary £670 p.a.

Applications, stating age, qualifications, and experience, together with the names and addresses of 2 referees, should be addressed to the Secretary, Sidcup and Swanley Hospital Management Committee.

ST. ALBANS (near), HERTS. SHENLEY HOSPITAL. (2053 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR HOUSE OFFICER (whole-time) required for 1 year in the first instance, at above Hospital. The Hospital may be visited by appointment.

Applications to the Medical Superintendent, Shenley Hospital.

ST. ALBANS CITY HOSPITAL. (425 Beds.) Applications are invited from registered medical practitioners for the appointment of HOUSE PHYSICIAN (House Officer grade) for 1 of the 2 medical teams. Post vacant 1st June, 1952, and tenable for 6 months.

Applications, together with the names of 2 referees, should be sent to the Secretary, Mid-Herts Group Hospital Management Committee, Osterhills, Normandy-road, St. Albans.

SWANSEA HOSPITAL. (403 Beds.) Glantawe Hospital MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of CASUALTY OFFICER of Junior Hospital Medical Officer grade to the above Hospital.

Full particulars of age, qualifications, and experience, should be forwarded to— O. C. HOWELLS, Secretary,
Glantawe Hospital Management Committee.
St. Helen's-road, Swansea.

SWANLEY, KENT. KETTLEWELL HOSPITAL. (Telephone : Swanley Junction 172.) Applications are invited for the resident appointment of SENIOR HOUSE OFFICER. The Hospital is one of the Regional Centres for the short-term treatment of pulmonary tuberculosis, and its Outpatients Clinics deal with all varieties of chest disease. The post offers good facilities for training in this specialty. Previous experience in the treatment of tuberculosis desirable. Applicants are invited to visit the Hospital by appointment with the Physician-Superintendent.

Applications should be addressed to the Secretary, Queen Mary's Hospital, Sidcup, Kent.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON required for post vacant 16th June. Post recognised for the F.R.C.S. Salary on national scale.

Applications, stating age, experience, qualifications with dates, together with copies of 2 testimonials, should be sent to the Administrative Officer.

TAUNTON AND SOMERSET HOSPITAL. (Musgrove Park and East Reach Branches—12 Residents.) Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (chest diseases). Duties will include work in Outpatients Clinics, Sanatorium, and Hospitals Wards (Pulmonary Tuberculosis both Medical and Surgical). Salary is in accordance with the National Health Service scale.

Applications, stating age, qualifications with dates, nationality, and details of experience, together with 2 recent testimonials, should be sent immediately to the Secretary, Taunton Hospital Management Committee, Musgrove Park Hospital, Taunton, Somerset.

TAUNTON AND SOMERSET HOSPITAL. (Musgrove Park Branch and East Reach Branch—12 Residents.) TAUNTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of HOUSE PHYSICIAN (pædiatric). Salary in accordance with the National Health Service scale. The post is recognised by the Royal College of Physicians as a qualifying appointment for the Diploma of Child Health.

Applications, stating age, qualifications with dates, nationality, and details of experience, together with 2 recent testimonials, should be sent immediately to the Secretary, Taunton Hospital Management Committee, Musgrove Park Hospital, Taunton, Somerset.

TAUNTON AND SOMERSET HOSPITAL. (Musgrove Park Branch and East Reach Branch—12 Residents.) TAUNTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of HOUSE SURGEON (traumatic and orthopædic). Salary in accordance with the National Health Service scale. The post is recognised by the Royal College of Surgeons as a qualifying appointment for the Final Fellowship Examination.

Applications, stating age, qualifications with dates, nationality, and details of experience, together with 2 recent testimonials, should be sent immediately to the Secretary, Taunton Hospital Management Committee, Musgrove Park Hospital, Taunton, Somerset.

TILBURY AND RIVERSIDE GENERAL HOSPITAL. ORSETT BRANCH. Applications are invited for the post of HOUSE SURGEON at the above Hospital for the General Surgery and Orthopædic Departments. The post, which becomes vacant in late May, 1952, is for 6 months in the first instance.

Applications, together with copies of not more than 3 recent testimonials, should be forwarded to the undersigned as soon as possible. G. E. WHYTE, Secretary,
South East Essex Hospital Management Committee.
Thurrock Hospital, Grays, Essex.

TORQUAY. TORBAY HOSPITAL. (166 General Beds.) RESIDENT SENIOR SURGICAL HOUSE OFFICER (Male or Female) required immediately. Appointment for 1 year. Salary £670 p.a., less £100 in respect of accommodation and services.

Applications, stating qualifications, nationality, and age, with copies of testimonials, to be sent to the Secretary, Torquay District Hospital Management Committee, 62/64, East-street, Newton Abbot, S. Devon.

TREDEGAR. ST. JAMES HOSPITAL. (38 Beds for acute medicine, 75 chronic sick, 46 obstetrical.) RESIDENT SENIOR HOUSE OFFICER (Male or Female) required on 1st July at above Hospital. Term of appointment 12 months. Salary £670 p.a., less an agreed deduction for full residential emoluments. Medical establishment comprises Visiting Physician, Geriatrician, and Obstetrician, together with Resident Senior Hospital Medical Officer and Junior House Officer.

Apply to the Hospital Management Committee Secretary, District Miners Hospital, St. Martins-road, Caerphilly.

TRURO. ROYAL CORNWALL INFIRMARY. (General Hospital : 212 Beds—8 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for HOUSE SURGEON (Male or Female) for General Surgery and Gynæcology, post now vacant. The successful candidate will be responsible jointly with the House Surgeon for the 66 Beds allocated to the 2 specialties. Salary and conditions of service in accordance with the terms laid down by the Ministry of Health.

Applications, stating age, qualifications, and experience, and enclosing copies of 2 recent testimonials, should be sent to the Administrative Assistant, Royal Cornwall Infirmary, Truro, Cornwall.

WOLVERHAMPTON HOSPITAL MANAGEMENT COMMITTEE, GROUP NO. 16, BIRMINGHAM REGION.

The Royal Hospital, Wolverhampton (an Associated Hospital of the University of Birmingham Medical School)
SENIOR HOUSE OFFICER (Fracture and Orthopædic Department).
HOUSE OFFICER (Fracture and Orthopædic Department).
HOUSE OFFICER (Junior Casualty Officer).

Wolverhampton and Midland Counties Eye Infirmary (recognised for the full course of instruction for admission to the D.O.M.S.)
SENIOR HOUSE OFFICER.
HOUSE OFFICER.

New Cross Hospital, Wolverhampton
HOUSE OFFICER (general surgery).

Applications, with copies of 3 recent testimonials, to be sent to W. COCKBURN, Group Secretary.
The Royal Hospital, Wolverhampton.

WILLESBOROUGH HOSPITAL, near Ashford. South EAST KENT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE SURGEON required at the above Hospital. Good experience in general surgery with some casualty work. Salary £350, £400, or £450 a year, less £100 a year for residential emoluments.

Applications, stating age, qualifications, and the names and addresses of 2 referees, to be made to the Group Secretary, "Ash-Eton," Radnor-park West, Folkestone.

WARRINGTON (near). WINWICK HOSPITAL. (2200 Beds.) Locum Tenens JUNIOR HOSPITAL MEDICAL OFFICER required immediately at above Hospital. All modern methods of treatment of mental illness and nervous disorders are available. Salary £700 p.a., with an appropriate deduction in respect of residential charges.

Applications, giving full details of qualifications, experience, &c., and accompanied by copies of 2 recent testimonials, to be sent to the Medical Superintendent as soon as possible.

WARRINGTON GENERAL HOSPITAL. (368 Beds.) Applications are invited for 2 RESIDENT HOUSE PHYSICIANS (Male or Female). The salary scale is £350–£450 p.a., less a deduction of £100 for residential emoluments. The appointments offer a wide and comprehensive experience in general medicine, including acute medical, paediatric, and infectious diseases. Staffing of the Medical Unit consists of a Registrar, Paediatric Senior House Officer, and 2 House Physicians.

Applications should be forwarded to—

H. L. BOOT, Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.

WARRINGTON GENERAL HOSPITAL, Warrington, LANCS. (368 Beds.) Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (surgical), Male or Female. Commencing salary £670 p.a., less £130 for residential emoluments. The post offers a wide experience in general surgery. Staffing of the Surgical Unit also includes a Senior Registrar and 2 House Surgeons.

Applications should be forwarded to—

H. L. BOOT, Secretary, Warrington
and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.

WARWICK HOSPITAL, Lakin-road, Warwick. (348 Beds—General.) SOUTH WARWICKSHIRE HOSPITAL GROUP NO. 14. Applications are invited from registered medical practitioners (Male or Female) for the appointment of CASUALTY OFFICER (Senior House Officer, £670), resident or non-resident. The post is vacant on 1st May, 1952, is suitable for person reading for higher qualifications, offering facilities for contact with all Specialist Units in the Hospital.

Applications, with the names and addresses of 3 referees, to be sent to the Medical Superintendent.

WHISTON. COUNTY HOSPITAL. (882 Beds.) Applications are invited from suitably qualified practitioners for the appointment of RESIDENT OBSTETRICAL AND GYNÆCOLOGICAL HOUSE SURGEON. 6 months appointment. Salary £350–£50–£450 p.a., according to experience, less £100 for residential emoluments. The post is recognised for the M.R.C.O.G. examination.

Applications to be forwarded to the undersigned as soon as possible.

N. RICHARDS, Secretary, St. Helens and
District Hospital Management Committee.
Group Office, County Hospital, Whiston, near Prescot, Lancs.

WHISTON. COUNTY HOSPITAL. (882 Beds.) Applications are invited for the appointment of RESIDENT HOUSE SURGEON. 6 months appointment. Salary in accordance with the terms and conditions of service for medical staff.

Applications, stating age, qualifications, and experience, and giving 2 names for reference, should be forwarded to the undersigned as soon as possible.

N. RICHARDS, Secretary, St. Helens and
District Hospital Management Committee.
Group Office, County Hospital, Whiston, near Prescot, Lancs.

WIGAN AND LEIGH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following posts :—

Royal Albert Edward Infirmary, Wigan (Acute General Hospital—225 Beds)

CASUALTY OFFICER (House Officer grade post), recognised for F.R.C.S. examinations.

HOUSE SURGEON in General Surgery (House Officer grade post), recognised for F.R.C.S. examinations.

Leigh Infirmary, Leigh, Lancs (Acute General Hospital —102 Beds)

CASUALTY OFFICER (House Officer grade post), recognised for F.R.C.S. examinations.

HOUSE PHYSICIAN (House Officer grade post).

SENIOR HOUSE SURGEON (Senior House Officer grade post). The person appointed will be attached to the Surgical and Orthopædic Wards and will be required to undertake some duties in the Casualty Department along with other members of the resident staff.

Applications, stating age, qualifications, and details of previous employment, together with the names of 2 referees, should be forwarded to the Secretary, Wigan and Leigh Hospital Management Committee, Knowsley House, Wigan, as early as possible.

WINCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the full-time post of REGISTRAR (non-resident) to the Department of Physical Medicine in the above Group, to work at the main Hospital(s) and in the Peripheral Departments. The work will include all branches of physical medicine and the post is recognised by the Examining Board in England for Part II of the D.Phys.Med.

Forms of application may be obtained from the Secretary of the Winchester Group Hospital Management Committee, Royal Hampshire County Hospital, Winchester, and must be completed and returned within 14 days of the appearance of this advertisement.

WINDSOR. KING EDWARD VII HOSPITAL. House PHYSICIAN (paediatrics) required, Male or Female. Post vacant 10th June. Hospital recognised for D.C.H. Salary on national scale. The successful applicant will be resident at the Old Windsor Unit of the Hospital.

Applications, stating age, nationality, qualifications with dates, together with copies of 3 recent testimonials, should be sent to the Administrative Officer.

WATFORD AND DISTRICT PEACE MEMORIAL HOSPITAL, WATFORD, HERTS. (203 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER required at the above Hospital to fulfil the duties of Casualty Officer. Salary £700–£50–£1000, less £120 for board-residence.

Applications, stating age, qualifications, and experience, together with 2 recent testimonials, should be sent to—

CYRIL HOPKINSON, Administrator.

WESTON-SUPER-MARE GENERAL HOSPITAL. (110 Beds.) Applications are invited from registered medical practitioners for the resident appointments of 2 HOUSE OFFICERS (first or second posts), House Surgeons, duties to commence as soon as possible. Salary at the rate of £350–£400 p.a., according to previous posts held, less £100 in respect of residential emoluments.

Applications, stating age, qualifications, and experience, together with names and addresses of 2 referees, should be addressed to the Secretary, Weston-super-Mare Hospital Management Committee, c/o The General Hospital, Weston-super-Mare.

WEST BROMWICH AND DISTRICT GENERAL HOSPITAL, Edward-street, WEST BROMWICH. (144 Beds.) RESIDENT CASUALTY HOUSE OFFICER (second or third post). Salary within the range of £400–£450, according to experience, less £100 for residential emoluments.

Applications should be sent to J. O. ROBINS, Secretary, West Bromwich and District Hospitals Management Committee Group 18, at West Bromwich and District General Hospital.

WEST BROMWICH AND DISTRICT GENERAL HOSPITAL, Edward-street, WEST BROMWICH. (144 Beds.) Applications are invited for the post of HOUSE SURGEON (first or subsequent post). Range of salary £350–£450 p.a., according to experience, with deduction of £100 p.a. in respect of board and lodging. The post is tenable for 6 months.

Applications, together with 3 recent testimonials, should be submitted to— JOHN O. ROBINS, Secretary,
West Bromwich and District Hospitals Management
Committee Group No. 18.

WREXHAM. WAR MEMORIAL HOSPITAL. (170 Beds.) WREXHAM, POWYS, AND MAWDDACH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE SURGEON at the above Hospital, to commence immediately. Salary will be at the rate of £350, £400, or £450 p.a., according to experience, less £100 p.a. for full residential emoluments.

Applications, stating age, nationality, qualifications, and experience, together with copies of 2 recent testimonials, should be addressed to—

WILLIAM JONES, Secretary, Wrexham,
Powys, and Mawddach Hospital Management Committee.
Maelor General Hospital, Croesnewydd-road, Wrexham.

WREXHAM. MAELOR GENERAL HOSPITAL. (513 Beds.) WREXHAM, POWYS, AND MAWDDACH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON at the above Hospital, to commence immediately. The appointment is recognised for the Diploma of F.R.C.S. (Eng. and Edin.). Salary will be at the rate of £350, £400, or £450 p.a., according to experience, less £100 p.a. for full residential emoluments.

Applications, stating age, nationality, qualifications, and experience, together with copies of 2 recent testimonials, should be addressed to—

WILLIAM JONES, Secretary, Wrexham,
Powys, and Mawddach Hospital Management Committee.
Maelor General Hospital, Croesnewydd-road, Wrexham.

WREXHAM. MAELOR GENERAL HOSPITAL. (513 Beds.) WREXHAM, POWYS, AND MAWDDACH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE PHYSICIAN at the above Hospital. The appointment will be for a period of 6 months and will commence on 22nd May, 1952. Salary will be at the rate of £350–£450 p.a., according to experience, less £100 p.a. for full residential accommodation.

Applications, stating age, nationality, qualifications, and experience, with copies of 2 recent testimonials, to be addressed to the Secretary, Wrexham, Powys, and Mawddach Hospital Management Committee, Maelor General Hospital, Croesnewydd-road, Wrexham.

NORTHERN IRELAND HOSPITALS AUTHORITY invite applications for whole-time posts as SENIOR HOUSE OFFICERS and REGISTRARS in hospitals in Northern Ireland for the period 1st October, 1952–30th September, 1953. It is hoped to make appointments in all specialties, and they may be made in any of 3 grades—viz., Senior House Officer, Senior Registrar, and Principal Registrar, the analogous grades in Great Britain being Senior House Officer, Registrar, and Senior Registrar. Some of the appointments will be made jointly by the Queen's University, Belfast, and the Authority. These appointments will involve teaching and other University duties as Junior, Senior, or Principal Tutor.

Applications, stating the specialty in which the applicant is interested, should be made on a form, which may be obtained (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, Friends' Provident Building, 58, Howard-street, Belfast, and which must be returned so as to be received not later than 3rd May, 1952.

NORTHERN IRELAND HOSPITALS AUTHORITY invite applications for a post as ASSISTANT MEDICAL OFFICER at Downshire Hospital, Downpatrick (a Mental Hospital). The post will be on a whole-time basis for which the salary will be on the scale of £700–£50–£1000 p.a. In the first instance, appointment will be for the period ending 30th September, 1952.

Applications should be made on a form which may be obtained (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, Friends' Provident Building, 58, Howard-street, Belfast, and which must be returned to him so as to be received not later than 10th May, 1952.

U.S.A. BRIDGEPORT HOSPITAL, Bridgeport, Connecticut. ROTATING INTERNSHIPS available, also approved RESIDENCIES in Obstetrics, Pathology, and Surgery. Full maintenance. Stipend $100–$150 per month.
Apply Administrator.

NEW YORK. ALBANY HOSPITAL. Approved E.N.T. RESIDENCY available 1st July, 1952, at Albany Hospital, affiliated with Albany Medical College, Albany, New York. Salary $1200.

NEW YORK. ALBANY HOSPITAL. Pediatric Assistant RESIDENCY, for 1 year starting July, 1952, at the above Hospital. An active teaching service of the Albany Medical College carrying approval of the American Board of Pediatrics. Maintenance plus $50 a month.
Albany Hospital, Albany, New York, U.S.A.

Public Appointments

BIRMINGHAM. CITY OF BIRMINGHAM EDUCATION COMMITTEE. ASSISTANT SCHOOL MEDICAL OFFICER. Candidates must have had at least 3 years experience in the practice of their profession subsequent to obtaining a registrable qualification. Salary £850–£50–£1150 p.a. Previous experience in Local Government Service may be taken into account.
Forms of application (returnable by 24th May), together with further information, obtainable from the undersigned on receipt of a stamped addressed foolscap envelope. Communications should be endorsed "Assistant School Medical Officer." Canvassing disqualifies.
E. L. RUSSELL, Chief Education Officer.
School Health Service, 74/75, Broad-street, Birmingham, 15. 16th April, 1952.

BIRMINGHAM. CITY OF BIRMINGHAM HEALTH DEPARTMENT. Applications invited for part-time appointment of SPECIALIST DENTAL ANÆSTHETIST in Maternity and Child Welfare Department. Payment on sessional basis at rate of £4 4s. per session.
Applications, giving full qualifications, and stating number of sessions applicant can offer, together with 3 references, should be sent to Medical Officer of Health, Council House, Birmingham, 3, not later than 1st May, 1952.

BIRMINGHAM. CITY OF BIRMINGHAM. Public HEALTH DEPARTMENT. Applications are invited from registered medical practitioners for the whole-time appointment of ADMINISTRATIVE MEDICAL OFFICER OF HEALTH for Mental Health. Applicants should have had special experience in all branches of the Mental Health Service and should hold the Diploma in Psychological Medicine. The successful candidate will be responsible to the Medical Officer of Health for the general administration and medical direction of all branches of the Council's Mental Health Services and for the performance of such other duties in this connection as may be required. Salary within the scale of £1600–£50–£1850 according to experience. Motor-car allowance payable. The candidate selected will be required to pass a medical examination, and to contribute to the Local Government Superannuation Act, 1937, and to the Birmingham Municipal Officers Widows' and Orphans' Pensions Fund. The appointment is terminable at 3 months notice. Canvassing disqualifies.
Applications, with 3 recent testimonials, to be forwarded to the Medical Officer of Health, Public Health Department, Congreve-street, Birmingham, 3, not later than 17th May, 1952.

COVENTRY. CITY OF COVENTRY. Applications invited for the post of holiday locum to act as ASSISTANT MEDICAL OFFICER in the Maternity and Child Welfare Service of this authority for a period of 2 months from 1st August next. Duties will include attendance at medical sessions at infant-welfare clinics, antenatal and postnatal clinics, special women's clinics, and day nurseries; and such other medical duties as the Medical Officer of Health may require. Salary within the scale £850–£50–£1150, according to qualifications and experience.
Applications to the Medical Officer of Health, Council House, Coventry, by 17th May, 1952.

FACTORY DOCTORS: Factories Acts, 1937 and 1948. The following appointments as Appointed Factory Doctor under the Factories Acts, 1937 and 1948, are vacant. Applications should be sent to the Chief Inspector of Factories, 8, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of application*
SIDMOUTH ..	DEVON	10TH MAY, 1952
HELENSBURGH ..	DUMBARTON	10TH MAY, 1952

HER MAJESTY'S COLONIAL SERVICE, British Guiana. ANÆSTHETIST (Man or Woman) required for Public Hospital, Georgetown. Duties include administration of anæsthetics; the training of medical staff in anæsthesia; and advising other Government hospitals in this specialty. Appointment will be on agreement for 3 years. Candidates in the National Health Service may resign from the National Health Service but retain their superannuation rights during their time in British Guiana (up to 6 years), and receive a resettlement grant of 20% of the aggregate of their Colonial salary on leaving British Guiana at the end of their engagement. The salary scale ranges from $4800 to $5760 (£1000–£1200) p.a. Private practice is not allowed but 50% of consultation fees are payable to the officer. Free quarters are provided. Free passages are provided for officer, his wife, and children, not exceeding 5 in all. Income-tax at local rates. Generous home leave. Climate is sub-tropical and healthy for Europeans. Candidates should possess qualifications which are registrable in the United Kingdom, and a Diploma in Anæsthetics.
Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference (No. 27215/167).

HER MAJESTY'S COLONIAL SERVICE, British Guiana. Medical Officers possessing qualifications registrable in the United Kingdom are required for the following posts in British Guiana:—
(1) MEDICAL OFFICER OF HEALTH, duties may include: port health services; inspection of schools; lectures and demonstrations on health matters; maternity and child welfare; and venereal disease control. Candidates must possess a Diploma in Public Health.
(2) DOCTOR (Man or Woman) to take sole charge of E.N.T. Department at the Public Hospital, Georgetown. Candidates should possess a diploma in Laryngology and Otology or other recognised qualification. Private practice is not permitted but 50% of consultation fees are payable to the Officer.
Appointments will be on a permanent basis with pension (non-contributory) at the age of 55. Salary scale ranges from $4800 to $5760 (£1000–£1200) p.a., plus a pensionable specialist allowance of $720 (£150) a year for holders of specialist qualifications. Pension is earned at the rate of 1/600th of the final pensionable emoluments for each completed month of service. Alternatively, employment is offered on agreement for 3 years in the first instance. Candidates in the National Health Service may resign from the National Health Service but retain their superannuation rights during their time in British Guiana (up to 6 years), and receive a resettlement grant of 20% of the aggregate of their Colonial salary on leaving British Guiana at the end of their engagement. Quarters are provided free at institutions; otherwise at low rental. Free passages are provided on appointment, and on satisfactory completion of engagement, for officer, wife, and children, up to 5 persons in all. Income-tax at local rates. Normal tour of service is from 2 to 3 years. Generous home leave is granted after each tour. Climate is, generally speaking, healthy for Europeans.
Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. 27215/212/52).

HER MAJESTY'S COLONIAL SERVICE, Malaya. Doctors having medical qualifications registrable by the General Medical Council in the United Kingdom with 1 or more years experience after qualification, are required for appointments as:—
MEDICAL OFFICERS and MEDICAL OFFICERS OF HEALTH for general medical and health duties.
Appointment is available:—
(*a*) on probation for permanent establishment; (*b*) on employment from the National Health Service, and (*c*) on short-term contract with gratuity:—
(*a*) Permanent terms. Subject to 3 years probation, appointment is permanent with pension (non-contributory) at age 55. Salary is paid in the scale £952–£42–£1204–£1274–£42–£1652 p.a. There are many posts, specialist and administrative, available on promotion carrying higher salaries (up to about £2400 for the highest post). Promotion is often made before reaching the top (£1652) of the long scale. There is also a cost-of-living allowance at varying rates, according to family circumstances, subject to maximum of £336 p.a. for single men, and of £707 p.a. for married men with children (both rates higher when stationed in Singapore).
Note.—Doctors with more than 1 year's approved experience after age 25 (including service in H.M. Forces) enter the salary scale at points above the minimum according to their experience; *and* 4 increments of salary are also given to holders of approved higher qualifications (e.g., F.R.C.S., M.R.C.P., D.P.H., D.A., &c.).
(*b*) National Health Service. Doctors may resign from the National Health Service but retain their superannuation rights during their time in Malaya (up to 6 years) and receive a resettlement grant of 20% of the aggregate of their Malayan salary on leaving Malaya at the end of their engagements. Emoluments as under (*a*) including incremental credit for experience and higher qualifications as in note under (*a*). Doctors so appointed may be considered for permanent terms at any time during their colonial employment provided they surrender their rights to the resettlement grant and payment by Malayan Governments of superannuation contributions.
(*c*) Contract terms. The contract will be for 3 years resident service, renewable for a further tour of 3 years by mutual agreement. Salary and cost-of-living allowance as under (*a*) including incremental credit for experience and higher qualifications as in note under (*a*). In addition a gratuity earned at the rate of £300–£450 p.a. according to salary is paid on expiry of contract.
Doctors on contract may be considered for appointment to the permanent establishment at any time on their agreeing to surrender their gratuity earning rights.
In all 3 types of appointment the rates of salary and gratuity refer to doctors eligible for "expatriate terms" under Malayan Regulations (i.e., those whose permanent homes are in the United Kingdom, Ireland, Australia, Canada, &c.).
A limited number of practitioners liable for call up under the National Service Act, 1948, may apply, and if appointed will be granted indefinite deferment of call up on completion of a minimum period of 1 tour of 3 years in the Malayan Medical Service.
The climate is, for the tropics, healthy. European children do well up to the age of about 6 and schools are available locally. Income-tax is payable at Malayan rates which are lower than those in the United Kingdom. Government quarters with heavy furniture are provided at a low rental or an allowance is paid in lieu of quarters. Free passages are provided for the doctor, his wife, and children under the age of 10 (not exceeding 4 persons besides himself) on appointment and once each way during each tour of duty of 3–4 years. Generous home leave is granted and local leave is permissible. The social and recreational facilities in Malaya are good.
Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. 27215/242/51).

ROYAL NAVAL MEDICAL SERVICE

Candidates are invited for service as Medical Officers in the Royal Navy—preferably below 28 years.

They must be British subjects whose parents are British subjects, and be medically fit. No examination will be held but an interview will be required.

Initial entry will be for 4 years' short service after which gratuity of £600 (tax free) is payable, but permanent commissions are available for selected short-service officers.

Officers entered on or after 1st January, 1951, will be eligible to be considered for ante-dates of seniority up to 2 years for service in recognized civil hospitals, etc.

For full details apply MEDICAL DIRECTOR-GENERAL, Admiralty, S.W.1.

AMENDED ADVERTISEMENT

FLINT. COUNTY OF FLINT. Applications are invited from duly qualified and registered medical practitioners for the appointments of ASSISTANT MEDICAL OFFICERS. Previous experience of local health authority maternity and child-welfare services and of school-health services will be an advantage. Remuneration will be in accordance with the Award of the Industrial Court No. 2285 (£850, rising by annual increments of £50 to a maximum of £1150). An appropriate allowance for travelling and subsistence will be payable. The appointments are superannuable and the successful candidates will be required to satisfy a medical examination.

Forms of application, together with further particulars, can be obtained from the County Medical Officer, Flintshire County Council, Llwynegrin, Mold, and on completion should be forwarded to the undersigned not later than 10th June, 1952.

W. HUGH JONES, Clerk of the County Council.

County Buildings, Mold.

LANCASHIRE COUNTY COUNCIL. Divisional Medical OFFICER, Health Division No. 13 (Heywood). Applicants must be medical practitioners holding the D.P.H. or equivalent qualification and with administrative experience. The Divisional Medical Officer will be required to act as Medical Officer of Health to the County Districts within the Division where they so desire. Basic salary as Divisional Medical Officer is £1300–£50–£1700. This scale will be substantially increased if the Divisional Medical Officer is appointed Medical Officer of Health to one or more County Districts. Appointment is superannuable and subject to passing a medical examination.

Full particulars and application forms obtainable from the County Medical Officer, East Cliff County Offices, Preston, to be returned by 5th May.

SHEFFIELD EDUCATION COMMITTEE. Applications are invited from duly qualified medical practitioners (Men and Women) for appointment as ASSISTANT SCHOOL MEDICAL OFFICER. Special consideration will be given to the applications of candidates who have had experience in the treatment of children. Possession of the D.P.H. or D.C.H. qualifications will be an advantage. Salary £850 p.a. rising to £1150 p.a. by annual increments of £50. Superannuable post. Subject to satisfactory medical examination.

Application forms and particulars of the appointment obtainable on receipt of stamped addressed foolscap envelope, to be returned to the Director of Education, Leopold-street, Sheffield, by 10th May, 1952.

SHEFFIELD EDUCATION COMMITTEE. Applications are invited from duly qualified Dental Surgeons (Men and Women) for appointment as SENIOR SCHOOL DENTAL SURGEON. Salary £1250 p.a. rising to £1550 p.a. by annual increments of £50. Superannuable post. Subject to satisfactory medical examination.

Application forms and particulars of the appointment obtainable on receipt of stamped addressed foolscap envelope, to be returned to the Director of Education, Leopold-street, Sheffield, by 10th May, 1952.

General Practice

For an ***Executive Council post*** *apply on form* E.C.16A *obtainable from the council. Mark envelope "Vacancy."*

DONCASTER. Applications invited for Vacancy, chiefly Urban, list at present approximately 1600, residence and surgery available. Apply on Form E.C.16A before 3rd May, 1952, to the undersigned, giving details of professional experience, age, other supporting particulars, and any references it is desired to submit.

A. JACKSON, Esq., Clerk of the Council.

Doncaster Executive Council, 6, Albion-place, South-parade, Doncaster.

ROSS AND CROMARTY EXECUTIVE COUNCIL. A VACANCY occurs in the District of Torridon, in the Parish of Applecross, for a General Medical Practitioner of suitable qualifications and experience to provide general medical and maternity services under the National Health Service. Number on list 433 approximately. House available. Good mileage allowance. Apply, stating age, experience, and enclosing 8 copies of references, to, the Clerk, Tulloch-street, Dingwall, before 17th May, 1952.

KINTBURY, BERKSHIRE. Applications invited for VACANCY (rural area). List at present approximately 1950. Residence believed to be available. Apply on Form E.C.16A, before 7th May, 1952, to the undersigned.

G. H. J. PRICE,
Clerk of the Berkshire Executive Council.

16, Eldon-road, Reading.

THORNTON HEATH, Croydon, Surrey. Applications invited for VACANCY (urban). List at present approximately 1600. Tenancy of surgery may be available, and residence of retiring doctor (¼ mile from surgery) is available for purchase, if required. Apply on form E.C.16A by not later than 10th May, 1952, to—

S. C. SULLIVAN,
Clerk of the Croydon Executive Council.

14, Katharine-street, Croydon.

Hospital Services : Non-Medical Appointments

CARDIFF. UNITED CARDIFF HOSPITALS. Medical PHOTOGRAPHER required to take charge of a new department at the Cardiff Royal Infirmary. Applicants should preferably be on the medical register of the I.B.P., but previous hospital experience is essential. Salary £500–£25–£600 p.a.

Applications, giving the names of 2 referees, and full personal and professional details, to the undersigned before 9th May.

ARNOLD TUNSTALL,
Secretary and Principal Administrative Officer,
The United Cardiff Hospitals.

Cardiff Royal Infirmary, Newport-road, Cardiff.

HERTFORD COUNTY HOSPITAL, Hertford, Herts. Applications invited for post of PATHOLOGICAL LABORATORY TECHNICIAN (Male). Experience in hospital laboratory work essential. Qualifications, salary, and conditions of service in accordance with Whitley Council Professional and Technical "B" recommendations. Successful candidate may ultimately be considered for promotion to Senior Technician. Post superannuable.

Applications, stating details, and names of 2 referees, to Administrative Officer.

NORTHERN IRELAND HOSPITALS AUTHORITY. Applications are invited from suitably qualified persons for the post of MEDICAL LABORATORY TECHNICIAN at Belfast City Hospital. Salary £410 p.a. rising by annual increments of £15 to £455 p.a. and thence by a single increment of £20 to a maximum of £475 p.a. Candidates must hold the Associateship of the Institute of Medical Laboratory Technology, or possess equivalent qualifications. The person appointed will be an officer of the Northern Ireland Hospitals Authority, and the salary will be subject to deductions for superannuation under regulations made under the Health Services Act (Northern Ireland), 1948. It is the Authority's policy to give preference to candidates who have served in H.M. Forces in war-time.

Applications, stating age, qualifications, and experience, to the Secretary, South Belfast Hospital Management Committee, Belfast City Hospital, Lisburn-road, Belfast. Canvassing, either directly or indirectly, will be an absolute disqualification. Any approach to a member of the Authority or a member of a Committee of the Authority, in writing or otherwise, by or on behalf of any applicant, will be regarded as canvassing.

Miscellaneous

To ***non-professional*** *posts the Notification of Vacancies Order 1952 applies*

Evans Medical Supplies Ltd. have a Vacancy for a Senior Executive, Male or Female, in their Medical Information Department. Duties include the preparation of technical literature and information bulletins, the abstracting of medical and other technical papers and replies to technical inquiries. Previous experience of this type of work is desirable and literary ability essential.—Applications, giving full details of career, should be addressed to the Medical Director, Evans Medical Supplies Ltd., Speke, Liverpool, 19.

Genatosan Limited, of Loughborough, are desirous of engaging, on a retainer basis, the services of a General Practitioner, who is up to date with therapeutic trends and has sufficient time to devote to the purposes of general liaison; commercial advice on new products; technical briefing of Representatives; guidance on medical literature; and reporting on investigations with new products. For the sake of easy and mutually satisfactory contact, he should be residing within 15–20 miles of Loughborough.—Applications, giving full details of academic career, practical experience, and present commitments, should be addressed to the Marketing Manager, Genatosan Limited, Loughborough, Leics, and marked "Confidential."

Doctor's conscientious Secretary/Shorthand-Typist, available full or part time. London area.—Address, No. 671, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

E.N.T. Consultant desires another Consultant to share his Consulting-room in Harley-street area—Address, No. 669, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Near Harley-street. Furnished flat, 1 sitting-room, 2 bed-rooms, bathroom, kitchen, gas-cooker, Ascot heater, refrigerator, telephone. 7 guineas.—Address, No. 670, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Wanted. Drinker and Yoffey's "Lymphatics."—KINMONTH, St. Bartholomew's Hospital, London.

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE, LTD., 98 Victoria-street, S.W.1 (Phone: VICtoria 0141), who are specialists in this kind of work.

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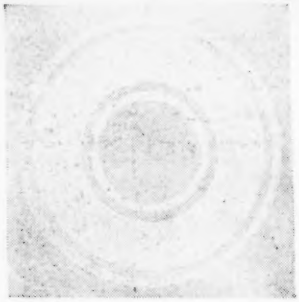

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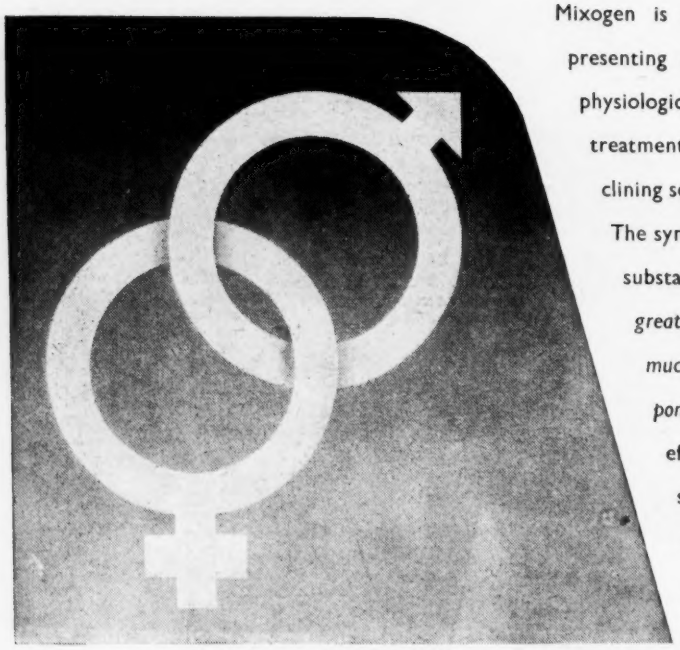

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